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TREATMENT OF COMPOUND FRACTURES IN THIS ANTIBIOTIC AGE

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Since one of the chief objectives in the treatment of compound fractures is to prevent or combat infection in the wound, and since the introduction of antibiotics has profoundly influenced treatment of infections in general and of the pyogenic infections in particular, it seems in order to review the treatment of compound fractures in the light of the present day knowledge of antibiotics and the facility with which these potent agents can be used. In connection with some other work, I recently sent a questionnaire to a group of 24 orthopedic surgeons, in which I inquired about their use of antibiotics and other measures in the treatment of compound fractures. I found that there are wide differences of opinion concerning the dosage of antibiotics as well as minor differences on other phases of the treatment of these injuries.

Since compound fractures are among the most frequent and important injuries that man is heir to in time of peace as well as in time of war, it is evident that an effort should be made to standardize the treatment of these grave injuries. However, not only is there considerable variation in the character and severity of the lesions present and in the degree of contamination of the wound, but there is also considerable variation in the conditions under which the wound will be treated and in the capability of the surgeon who is to administer the treatment. Consequently, it is hardly possible to standardize the treatment of these injuries, but it is possible to present a method of treatment that is reasonably elastic and thus capable of modification in the hands of the individual surgeon and yet to offer a procedure that will yield a satisfactory result in a high percentage of the cases. This paper is an attempt to present such a method.

EMERGENCY TREATMENT

A compound fracture is nearly always a serious injury and will necessitate surgical treatment. In most instances the patient should be admitted to the hospital if one is available within a reasonable distance from the site of the accident and if transportation to the hospital is possible. At the site of the accident the treatment will vary with the severity of the wound and the condition of the patient. The injury may vary from a laceration with fracture of the terminal phalanx of a finger or toe to an injury of the utmost gravity, in which the patient is either killed outright or in which his life is in imminent danger. At the site of the injury the extremity should be straightened and gross deformities reduced by manual traction, and this traction may be continued until a temporary splint has been applied. The wound should be covered with a clean dressing. If possible, this should be a sterile dressing. If such is not available, a clean piece of cloth may be applied to the wound and bound on with a suitable bandage. If hemorrhage is present and of sufficient degree to demand attention, efforts should be made to control the hemorrhage either by means of a pressure dressing or of a tourniquet. If necessary, a tourniquet can be improvised. If sulfonamide powder is available, this may be sprinkled in the wound before the dressing is applied.

The question then arises as to whether or not the fracture should be splinted by rigid external fixation on the spot, and there are many surgeons who believe that the old dictum "splint them where they lie" should be applied to the treatment of every compound fracture, regardless of the gravity of the wound or of the distance over which the patient must be transported before he reaches a hospital where definitive treatment can be administered. Common sense should determine the cases in which splinting should be done before the patients are moved from the scene of the accident. In civilian life most injuries occur in situations in which the patient can be taken to a hospital and in which the journey will require less than one hour; consequently, it is not necessary to apply rigid splints to every compound fracture. Such splints need be applied in only those cases in which transportation without splinting will be very painful or increase the damage to the soft tissues and thus promote shock and hemorrhage. This applies especially to fractures of the femur and of both bones of the leg and to severe fractures and fracture dislocations at the ankle and of the arm or forearm. In some instances a fractured upper extremity can be supported on a pillow or the arm and forearm can be bound to the chest, and a fractured lower extremity can be bound to the opposite lower extremity if necessary. Likewise, all patients with frac-

From the Department of Surgery, Washington University School of Medicine.
Read at the Fourth Clinical Session of the American Medical Association, Cleveland, December 8, 1950.

tures, except the severe ones mentioned above, can usually be transported with relative safety in an automobile. Persons with major fractures of the lower extremity should be permitted to lie where they are until an ambulance can be sent for and they can be transported in a recumbent position. In case of doubt, splints should be applied and an ambulance should be used.

Usually it is not necessary to give any antibiotics at the site of the accident because this type of treatment is better given at the hospital, where a record will be kept of the drugs that have been administered. On the other hand, if it is known that considerable time will elapse before definitive treatment is instituted, it is well to give a severely injured patient a single large dose of penicillin —not less than 100,000 units and, preferably, 400,000 units, of penicillin G procaine fortified.[1] The same policy should be followed for sedation. If the patient is suffering a great deal of pain and morphine or another sedative is available, it should be given in a dose sufficient to make the patient relatively comfortable. This not only will relieve pain but will also tend to lessen shock. Some object to morphine in the presence of brain injury, but it may do more good than harm.

TRANSPORTATION

The patient should be taken as soon as possible to a hospital where expert treatment is available and will be given. As stated above, he should be transported in an ambulance if he is suffering from a major fracture of the lower extremity. Otherwise, he can usually be moved more expeditiously in an automobile. He need not be taken at breakneck speed, as minutes are less important than is avoidance of roughness in transport and in handling the limb.

ADMISSION TO THE HOSPITAL

The patient should be admitted to the hospital as an emergency case with as little "red tape" as possible. He should not be taken to the x-ray room immediately, but should be left in the emergency room or put in a comfortable bed and examined by a competent surgeon who has had sufficient experience and judgment to enable him to evaluate other injuries, such as those to the head, chest, and abdominal and pelvic viscera, and the general condition of the patient. If the patient is in a condition of surgical shock or if shock is impending, this is the major consideration and efforts should be made immediately to combat the shock with the usual measures: elevation of the foot of the bed, rest, application of external heat, and replacement of blood by plasma or fluids and then whole blood, as necessary. If he has lost much blood, it should be replaced as soon as possible. Also, he should be relieved of pain. If his wound is not properly dressed, a proper dressing should be applied, and, if indicated, the fracture should be immobilized either by traction or by a splint. Oxygen may be administered if it is indicated. If hemorrhage is present, it should be arrested by suitable means—tourniquet, clamp or pressure dressing. The patient should be kept warm, quiet and comfortable while in shock. He should be given a large dose of penicillin as soon after admission as possible if it has not been administered elsewhere.

If the wound is covered by a satisfactory dressing, it should not be disturbed until the patient is in the operating room and ready for definitive treatment. An effort should be made to determine all injuries present as well as the time that has elapsed since the injury occurred; the time should be recorded because in a case of compound fracture the number of hours elapsed between the injury and the operation is an important factor in determining the method of procedure. If the patient is not in a condition of shock, he should be taken to the x-ray room as soon as an adequate history and physical examination have been completed. The blood count and typing for transfusion, if the patient is sufficiently injured to warrant this, should be done as part of the physical examination. Unless the fracture is suitably splinted, splints should be applied before the patient is sent to the x-ray room, since the usual x-ray technician is not qualified to manipulate an extremity in which there is a fresh fracture unless it is adequately splinted.

PREOPERATIVE TREATMENT

It is well to give a dose of morphine or other sedative as soon after the patient has been admitted as possible if this has not been done previously and is indicated. Likewise, the patient may be given 100,000 to 400,000 units of penicillin and 3,000 units of tetanus antitoxin or a booster dose of 1 cc. of tetanus toxoid if he has been immunized. These should be given and recorded if they were not given before admission.

He should be taken to the operating room as soon as is practicable. A few minutes are not important, but hours may be; this is especially true if six hours or more has elapsed since the time of the injury and the patient's admission to the hospital. If shock is present, x-rays may be made while the patients is in bed after he has begun to react from the shock, or they may be made in the operating room after the patient is on the operating table.

TREATMENT IN THE OPERATING ROOM

The patient should be placed upon either a regular operating table or a fracture table before the dressings and splints are removed. If the fracture involves the femur or both bones of the leg, it is especially desirable that he be placed on a fracture table and that traction be applied to the extremity in order that it may be supported in a position suitable both for operation and for the application of a plaster cast after the operation is finished.

Administration of the anesthetic is usually begun before the operative field is prepared. My associates and I usually use general anesthesia, but local, regional or spinal anesthesia may be used by those who are especially equipped to do so and are skilful in the use of these methods. A severely injured patient may be given plasma or blood before, during and after the operation as indicated by his general condition.

After the patient has been anesthetized, the dressings are removed, the extremity is placed in a suitable position for the operation, and the surrounding skin over a sufficiently wide area is scrubbed with soap and water (we now use one of the new antiseptic soaps, septisol[2]

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or pHisoderm,® which contain solution G 11 [hexachlorophene]). The skin is then shaved, and the scrubbing is continued until it is clean. It is then rinsed with sterile water or salt solution and wiped dry, then washed with ether, and iodine tincture or some other skin antiseptic is applied. During the preparation of the skin, the wound is covered with a sterile dressing and the washing and shaving are extended up to the edge of the wound. The wound may then be flushed with isotonic sodium chloride solution before the skin is dried and the skin antiseptic is applied. If the skin preparation has been done by the surgeon, he should now change his gown and gloves. The field is then draped and the operation of débridement of the wound and reduction of the fracture is performed. If the circulation distal to the fracture is adequate, an effort should be made to save the extremity.

DÉBRIDEMENT

The operation of débridement has as its objective the removal of devitalized and contaminated tissue and foreign material from the wound in order that it may heal without becoming infected. The manner in which it is performed varies considerably in different clinics. One surgeon may open the wound widely and remove little or no tissue, while another may perform a wide block excision of the wound, and there are all variations between these extremes. We believe in a conservative débridement, in which the margins and contaminated surfaces of the wound are excised and foreign material is removed. The wound is débrided in layers, but this is done with the sacrifice of as little viable tissue as possible. This requires a careful excision of the wound, layer by layer, care being taken not to force contaminated tissue into the depths of the wound by injudicious retraction or exploration. These statements do not apply to wounds that are more than 24 hours old, have not been adequately protected by sulfonamides or penicillin and are infected. These wounds are opened and washed thoroughly; necrotic material and foreign bodies are removed, and the wounds are then packed loosely with petrolatum gauze, and no effort is made to excise their infected surfaces.

In dealing with through-and-through wounds such as those caused by shell fragments or other missiles, both the wound of entrance and the wound of exit are débrided, the latter necessitating the more extensive operation. An exception is a compound fracture caused by a high velocity missile such as a rifle or machine-gun bullet. These wounds tend to be relatively sterile, and débridement is not necessary. The skin edges may be excised and the skin sutured, or the wounds may be painted with a skin antiseptic and covered with a sterile dressing and the fracture treated as a simple fracture, except that penicillin is given as in the postoperative care of compound fractures. In case of multiple wounds only the major ones are débrided.

The operation of débridement is performed either with or without a tourniquet, depending upon the location of the injury, the condition of the patient and of the extremity and the wishes of the surgeon. We usually use a pneumatic tourniquet, and this is released when the operation is finished and before the wound is closed or the pressure dressing is applied. Early in the operation the wound is inspected and material for culture obtained, usually with a cotton swab, from the depths of the wound; or some bits of devitalized tissue, especially muscle, are excised and implanted in suitable mediums. These cultures are especially valuable for the early detection of gas bacillus contamination and for determination of the penicillin resistance of bacteria in the wound.

The margins of the wound are excised, with removal of as little living skin as possible, usually a thin strip about ⅛ in. (0.3 cm.) wide entirely around the wound. Large, loose flaps of skin are saved when possible. However, skin should be excised if it has been subjected to crushing and is consequently thinned and obviously devitalized as well as soiled by dirt that has been ground into it. Although it is important to conserve as much skin as possible, it is not advisable to save skin that is dead and will slough and become infected. The knife and forceps that have been used in excising the margins of the wound are discarded.

The wound is then enlarged, usually by vertical incisions both upward and downward in such a manner that the edges can be retracted and the depths of the wound inspected. As the wound is inspected, any gross foreign bodies that are seen are removed. Blood vessels that are bleeding or that may bleed later are clamped and tied with fine absorbable surgical suture or silk as they are encountered. The wound is then irrigated gently with isotonic sodium chloride or sulfonamide solution and the subcutaneous and deeper tissues are débrided by excision of a thin layer of the surfaces of those tissues which were exposed in the wound. When dirt or other foreign material is embedded in the tissues, especially the loose areolar tissues, excision is preferable to an attempt to pick out the foreign material. Devitalized muscle is removed. This is muscle that is crushed, has lost its structure, is swollen, and does not bleed or retract when cut. On the other hand, much contused but viable muscle may be present in severe compound fracture wounds, and this muscle may be dark in color and swollen without being devitalized; usually this muscle should be allowed to remain. It is important to avoid removal of muscle that can be expected to live and resume its function. On the other hand, masses of dead muscle left in a wound will almost always lead to infection, and this cannot be prevented by the use of antibiotics. The débridement is as atraumatic and conservative as is consistent with a satisfactory operation.

If a joint cavity communicates with the wound, the margins of the capsule and synovial membrane extending around the wound and into the joint are excised, the cavity is thoroughly irrigated and inspected and foreign particles or loose pieces of bone or cartilage are removed. Contused or soiled cartilage is excised. If necessary, the opening into the joint is enlarged to permit inspection of the cavity. After it has been débrided and thoroughly irrigated, the joint cavity may be closed loosely, either with or without drainage.

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The bone is now inspected, and completely loose fragments of bone are removed, although very rarely a single large fragment that is loose may be washed off and

replaced for use as a graft or internal splint in order to preserve continuity and length of the shaft. All fragments of bone that are sufficiently attached to soft tissues to have a reasonable chance of surviving are left in the wound unless they are grossly soiled. The ends of the fragments are not removed unless they are grossly contaminated by dirt or other foreign material. If such material is ground into the bone or forced into the medullary canal, the ends of the fragments must be excised until only clean bone is left. When this is done, it is usually advisable to shape the ends of the fragments so that the fracture will be relatively stable when it is reduced and immobilized in a cast.

An exception to the above is in epiphyseal separations in which the end of the shaft has been forced into the dirt. We have hesitated to excise the end of the shaft for fear of interfering with growth; consequently, the epiphyseal end is scrubbed thoroughly with soap and water, usually by means of a sterile brush, then irrigated and replaced in the wound, only small portions that still contain dirt being excised with rongeur forceps.

The wound is again inspected, and a further search is made for any remaining foreign material or devitalized tissue in the wound. But the tissues are not widely opened in order to search for deeply buried missiles. These can be removed later if necessary. The ends of tendons and nerves that have been cut or torn are excised by a clean transverse section, and these tendons and nerves are then repaired, usually with fine silk if the condition of the wound and the patient permit. If for any reason haste is imperative, they may be simply tied together with fine silk or, preferably, with a stainless steel wire suture. The bodies of cut or torn muscles are united by widely spaced mattress sutures pulled just tight enough to coapt the ends, care being taken that all devitalized muscle is removed before the sutures are placed.

Reduction and Fixation of the Fracture.—The débridement and repairs having been completed, the displacement of the fragments is reduced as accurately as possible by traction and manipulation, and a decision is made as to whether or not internal fixation should be used. Since the advent of antibiotics and noncorrosive metals, internal fixation of compound fractures has been used with considerable success in a large number of cases. It offers the advantage of more complete immobilization of the fragments; this lessens the danger of postoperative trauma and of the development of dead spaces in the wound and thus lessens the danger of infection. On the other hand, the application of internal fixation, especially of screws, plates and medullary nails, adds to the trauma to the bone and further impairs the circulation of the bone. The same is true, to a lesser extent, of wires.

If internal fixation is not vitally needed, it should not be used. However, in fractures in which internal fixation will be of great advantage it may be used, and this is especially true in relatively fresh compound fractures that have been satisfactorily débrided and can be cared for by the surgeon after the operation. In fact we much prefer this to external skeletal fixation with multiple pins and, usually, to treatment by skeletal traction, as it saves time in the hospital.

A substitute for internal fixation is external skeletal fixation. This is provided by two Steinmann pins, one in the proximal and one in the distal fragment. These pins are applied after the operation is completed but usually before the wound is closed. It is advisable not to place them in the operative wound, but to insert them through intact skin and soft tissues. If reduction of the fracture is maintained until the cast is applied, these pins will usually insure that the fragments will not slip in the cast and they will always prevent shortening in the cast. The wound is again inspected and irrigated, not copiously but adequately, any further devitalized tissue is excised, and any further foreign material that can be identified is removed. For this final irrigation we use a saturated solution of sulfanilamide. The tourniquet is now removed, and any bleeding vessels that have been overlooked are ligated.

Closure of the Wound.—The next question is whether or not this wound should be closed. This will depend upon (1) the time that has elapsed since the accident, (2) the degree of soft tissue damage, (3) the amount and character of the soiling of the wound, (4) the ability of the surgeon to perform a satisfactory débridement, (5) whether or not it is possible to close the wound without too great tension, and (6) the postoperative care that the patient will receive. The decision is based upon the surgeon's experience and judgment, and it may be a very delicate one. We have successfully closed several wounds more than 24 hours old but do not advise this as a routine procedure even when the patient has received antibiotic therapy from the time of the accident.

In civilian life most compound fractures can be closed because they are seen relatively soon after the accident, the surgeon can keep in close contact with the patient after the operation, and it is not necessary that the patient be transported to another hospital after the operation.

In military life, and especially in war and under campaign conditions in which the skin is apt to be dirty before the injury is received and foreign material is apt to be carried deep into the tissues by the missile in shell or bomb injuries—especially when the patient is likely to be moved to another installation and cared for by another surgeon after the operation—the wound should be left open and closure attempted later by primary delayed or secondary closure.

If the wound is to be closed, the skin and subcutaneous tissues are approximated with a single layer of rather widely spaced sutures of chromicized absorbable surgical suture, silk or silkworm gut, depending on the choice of the surgeon. If such tension is present, this may be relieved by lateral incisions on either side of the extremity, thus permitting the skin to slide toward the wound, and, if necessary, these incisions may continue down through the subcutaneous tissue and even the deep fascia, and the defects may be covered with petrolatum gauze and permitted to heal by granulation, or a split thickness skin graft may be applied immediately. After the wound is closed, 100,000 units of penicillin is injected into the depths of the wound or into the joint if it is involved.

In some instances it is necessary to swing a flap of skin and subcutaneous tissue across the wound. When this is done, it is important that the flap have a sufficiently wide base and that it be sutured in position without tension and without constriction of the base, otherwise, it may slough and further complicate the condition of the patient. A definite effort should be made to cover nerves, tendons, and bones that are exposed in the wound.

In many instances, and especially in those in which, after débridement, there is a dead space or in which there has been extensive damage to the soft tissues, it is advisable to drain the wound for at least 48 hours. This is accomplished by a stab wound in the dependent portion of the wound. This stab wound is made sufficiently large so that a soft rubber tube or tissue, or a petrolatum gauze drain of adequate size can be passed through it to conduct fluid from the depths of the wound to the dependent surface of the extremity. Do not use through-and-through drains. In a wound involving a joint the synovial membrane can be closed loosely and the drain carried down to the membrane, or the end of the drain may enter the joint cavity, but drains should not pass through the cavity. If the wound is to be closed, the joint capsule and any ligaments that are cut or torn should be repaired. The drain should usually be removed in 48 hours and this removal can be accomplished through a small window in the cast.

If the wound is to be left open, it is packed loosely with gauze impregnated with petrolatum or preferably with fine mesh gauze impregnated with glycerin. The packing must be loose, otherwise it may act as a plug in the wound and promote infection. A pressure dressing is then applied. Pressure dressings are also used for the wounds that are closed but are especially desirable in those which are not closed. It consists of a mass of cotton waste or fluffed gauze (or, if this is not available, a rather heavy dressing of ordinary surgical gauze or cotton) that is bound onto the extremity with a gauze or woven elastic cotton (Ace® or tensor) bandage. Care is taken not to apply the bandage too tightly because it is important not to interfere with the circulation of the distal portion of the extremity. On the other hand, it should be tight enough to exert definite pressure and thus tend to prevent postoperative edema of the tissues as well as the accumulation of fluid beneath the skin. The extremity should be inspected at intervals, and, if at any time the circulation appears inadequate, the cast should be bivalved and the dressing loosened or split. It is our custom to use the pressure dressing whether the wound is left open or closed, and in case of doubt we are disposed to leave the wound open and to close it at a later time by either a primary delayed or a secondary suture, if possible. If this is not feasible, we may use skin grafts to cover the denuded area or may let the wound heal by granulation.

External Fixation.—After the pressure dressing has been applied, the extremity is immobilized in a splint with or without traction or in a plaster cast. In major fractures of the lower extremity that are to be immobilized in a splint with traction, the limb is supported on a Thomas knee splint or on one of another type, and skeletal traction is applied by means of a wire that is drilled through a suitable portion of the femur, tibia or os calcis. When traction is used on compound fractures in which the muscle has been severely damaged or destroyed, it is well to remember that considerably less weight is necessary than for a similar limb in which the muscles are intact; otherwise, serious distraction with delayed union or none may occur.

Most compound fractures are immobilized in plaster of Paris casts. When a cast is to be used, the pressure dressing and the extremity are wrapped in a layer of sheet cotton and the whole covered by the plaster bandage. Unpadded casts are dangerous in these injuries and are to be used only by those who are expert in this form of treatment. Care is taken to avoid displacement of the fragments during the application of the cast. The cast should be adequate for fixation of the part: a shoulder spica for injuries of the elbow, arm or shoulder and a hip spica for injuries of the hip, femur or knee. A plaster cast may also be used in the convalescent care of fractures that were treated by traction until the fragments began to unite. If necessary, one or more windows may be cut in the cast in order to permit dressing the wound.

Primary Delayed Suture.—Those wounds which are left open after débridement, but which are relatively clean, can in most instances be closed within from four to 10 days after the original débridement by a primary delayed suture. This is a simple closure of the wound without excision or undermining of the skin margins or excision of the surface of the wound. It is important that the wound be either sutured or covered with a skin flap or graft as soon as possible after the injury, as the successful closure of the wound converts the lesion into a simple fracture and this greatly simplifies the treatment.

Both primary delayed and secondary sutures are now performed without bacteriological control. It has been found that, with the aid of antibiotics, wounds that present a satisfactory appearance when the dressing is removed can be closed with relative safety. If, when the dressing is removed, bits of necrotic tendon, fascia or other tissue are found in the wound, these can be excised and the wound washed out, and if the latter looks clean it can then be closed with relative safety by simple interrupted sutures that draw the skin together. If this cannot be done without so much tension that the circulation is interfered with, it may be possible to close the wound by a plastic procedure (by sliding or shifting flaps of skin and subcutaneous tissue or by doing a split-skin graft). Tendons, nerves and bone should be covered if possible. When plastic procedures are used, denuded areas may be covered with a split-skin graft, and from that time on the injury is treated as a compound fracture that has been closed at the time of débridement. In many instances it is possible and wise to do the primary delayed suture through a window in the cast, thus avoiding the danger of displacing the fragments, and the same is true of secondary suture, though this is a more extensive procedure and may require a larger window.

Secondary Suture.—If for any reason the wound cannot practicably be closed by primary or primary delayed suture, it may be permitted to heal by granulation or be closed by secondary suture. The secondary suture

is a more extensive procedure than the primary delayed suture because it is frequently necessary to excise not only the margins of the skin that have begun to grow over the wound, but also the surface of the wound itself and to undermine the skin edges in order to bring them together. Since more time has elapsed since the original injury, there is not so much danger of displacement of the fragments in a secondary wound closure as there is in a primary delayed suture. After the secondary suture the wound is immobilized in a plaster cast and treated as though it were a simple fracture. If the position of the fragments is not satisfactory, it can be corrected at the time of the primary delayed or secondary suture.

Postoperative Treatment.—If the patient has not received adequate protection from tetanus before the operation this should be attended to as soon as is practicable after the operation. The chemotherapy usually begun before the operation is continued afterward as long as necessary. We usually give a single dose of 300,000 units of penicillin G procaine or a fortified dose containing 100,000 units of soluble penicillin and 300,000 units of penicillin G procaine daily after the operation. In very severe cases in which there is unusual risk of infection this dose may be doubled, or, if the surgeon prefers, the patient may be given 100,000 units of soluble penicillin intramuscularly every two or three hours for the first few days until the danger of invasive infection is passed, then the dose can be decreased. This procedure is continued until the temperature has been normal for five to seven days.

As a rule we do not use any of the other antibiotics, i. e., aureomycin, terramycin, streptomycin, and chloramphenicol (chloromycetin®), unless it is found that the organisms that contaminate the wound are resistant to penicillin and unless gram-negative bacteria have been detected in the wound or the patient is not doing well on the penicillin. In that case we may shift to one of the other antibiotics or continue with the penicillin accompanied with the other drug. There are now available vials containing 300,000 units of penicillin G procaine, 100,000 units of buffered penicillin G, and 1 gm. of dihydrostreptomycin, all of which can be administered in a single 3-cc. aqueous injection. It is possible that the use of combinations of penicillin with one or more of the other antibiotics for the prevention of infections in compound fractures will be routine in the future. At present we use only the penicillin unless there is a specific indication for the use of some other antibiotic.

If the patient is in shock, this condition should be treated with the usual methods, special attention being paid to restoration of the blood volume. If the patient is anemic, he should be given transfusions until his red blood cell count has reached an approximately normal status. He should also be put on a high-protein diet. If the patient complains of excessive pain, if the pulse rate is unduly accelerated or the temperature is unduly elevated, the cast should be bivalved or a window cut to expose the wound, which should be opened, or the packing removed, if necessary, to permit adequate drainage. If gas bacillus infection occurs, appropriate surgical treatment should be instituted as soon as possible. If the circulation in the extremity is insufficient on account of traumatic vascular spasm, an effort should be made to relieve this condition by blocking the lumbar sympathetic chain with procaine hydrochloride (novocaine®).

The postoperative care of the fracture is similar to that of a simple fracture of the same type, except that in a compound fracture the bones may heal somewhat more slowly than in a simple fracture. If further surgery in the wound is indicated, whether for the purpose of restoring continuity of nerves or tendons, for plastic procedures on the skin or soft tissue or for procedures on the bone, it can now be done as soon after the injury as the healing of the wound will permit and one no longer has to wait for a period of many months for the disappearance of any latent infection in the wound, because this condition can usually be controlled with antibiotics. Restoration of function in these patients is carried out along lines similar to those used in the treatment of simple fractures, except that in compound fractures the immobilization may have to be continued for a longer time and there may be soft tissue injuries that add to the disability.

It is thus evident that the advent and general availability of potent antibiotics have improved the results but have not greatly altered the treatment of compound fractures. These injuries must still be treated promptly, and shock must be combated, as in the past. Likewise, the wounds must be débrided carefully, and, if they are closed by primary suture, it must be effected without excessive tension, and they must be watched carefully afterwards.

With the aid of antibiotics we are permitted a little more leeway as regards the elapsed time during which a given wound may be closed and are able to use internal fixation more freely than in the past. The principal benefit that can be attributed to these agents is the ability of the surgeon to perform immediate closure or primary delayed suture on most wounds and to cover others with split-skin grafts and thus obtain prompt healing of many wounds that in the past would have been doomed to months of chronic infection with resultant loss of function of the part. It is to be noted, however, that the antibiotics do not perform miracles in compound fractures and that the successful treatment of these injuries demands the same high degree of surgical judgment and skill that it did before these agents were available.

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Neutromuscular Transmission.—The general acceptance of the acetylcholine theory in neuromuscular transmission is based not only on the overwhelmingly positive evidence, such as, for instance, that acetylcholine is released on motor-nerve stimulation, that injections of acetylcholine can imitate all details of motor-nerve stimulation, and that there is at the neuromuscular junction a concentration of the enzymes which synthesize and destroy acetylcholine; but also on what I may call the negative evidence—that is, whenever the possibility existed to try out whether the nerve impulse could cause contraction without acetylcholine the answer was no, the nerve impulse was unable to do so.—W. Feldberg, M.D., The Physiology of Neuromuscular Transmission and Neuromuscular Block, *British Medical Journal*, May 5, 1951.

ACCELERATION OF CONVALESCENT CARE OF POLIOMYELITIS PATIENTS

Charles L. Lowman, M.D., Los Angeles

In the convalescent phase of poliomyelitis, the problem of delay in definitive treatment with its resultant personal and economic hardship must be faced. Early in the course of each case, the paralytic patient and his parents should be given comprehensive understanding of the aims and sequence of treatment and the need for establishment of a streamlined tentative over-all care program. This will not only increase the patient's understanding of the problems ahead but, if sincere effort is made to shorten convalescence, will also save him time and money.

The tendency has been great to follow the old teaching that continuous muscle reeducation should invariably be continued over a period of one to two years even though the need for early surgical intervention is clearly indicated. Parents naturally wish to avoid surgery, and sometimes it is possible to continue muscle training for a considerable period with a chance of recovery. But when early surgery is clearly indicated, it in no way jeopardizes outcome. In fact, it frequently wards off deformity and improves the ultimate result.

Through the program of the National Foundation for Infantile Paralysis, extension of aid to thousands of children and adults who have been stricken with poliomyelitis has been made possible. The policy of the foundation and its 2,800 or more chapters has been to spare no expense in seeking a preventive, and to provide care for victims of the disease. But now after the severe epidemics and drain on the resources of the foundation during the last few years, it may be well to consider whether or not certain economies may be practiced without detriment to any individual patient.

Little can be done to shorten the time of the acute febrile phase of the disease in the general hospital contagious ward, but great economy can be effected if patients can be released from isolation care, as is now generally felt to be safe, at the end of one week or when fever ceases. This would permit earlier discharge for outpatient follow-up of the almost 50% of patients who recover without significant weakness or paralysis and permit great reductions in expenditures for hospital care. Of course, early institution of good care during the isolation period will also do much to hasten recovery.

In the hospitals where treatment is given in the subacute, convalescent, and reconstructive stages, economy may be considered in three aspects: (1) financial; (2) time or manhours of work; (3) time saved for patient. For patients needing assistance, hospital costs have been borne wholly or in part by the local foundation chapter. The patient is treated in the inpatient department (weeks, months, and not infrequently for years) at an average daily cost of $13.00 to $20.00. He is then referred home and returns to the outpatient department for physical therapy and medical care, which, at an average cost of $3.00 a visit, extends for many weeks or months. Chapter treasurer's report for Dec. 31, 1948, showed $822,-185 expended during the year for wheel chairs, crutches, transportation, braces, and similar items, or about 6.9% of the total spent. This does not cover epidemic nursing or the length of nursing service. Patients often are continued on physical therapy one to two years before surgical reconstruction is attempted or even recommended.

REEXAMINATION AND RECOMMENDATIONS

In my opinion, reexamination should be made of the usual method of giving physical therapy treatment for 12 to 16 months before surgical steps are taken. Instead a tentative plan of total care should be made for each patient. This should extend from the hot pack and passive motion stage through all aspects of therapeutic exercise, bracing, surgical reconstruction, and vocational training.

A thorough evaluation of performance, especially in relation to trunk muscle imbalances, should be made. Study of the muscle checks of 1,767 cases in the follow-up survey made by Dr. Robert Carroll of poliomyelitis patients from 1939-1942 and carried on under one of the earliest foundation grants shows that the recovery curve usually starts toward a plateau at the sixth month and flattens out about the eighth month. Occasionally, muscles show further improvement for six or eight more months. This report is in the files of the National Foundation for Infantile Paralysis and is outlined in a paper published in 1942.[1] As far as I know, it constitutes the largest study of its kind to date.

It is important to note whether the muscles showing improvement are those of the essential fixators which comprise the bases from which the intrinsic muscles of the legs and arms function. Essential for stabilization in the legs are the gluteals, quadriceps, and gastrocnemius, and in the trunk, the abdominal and lower spinal muscles. The abdominal musculature must be intact for stabilization of the pelvis in relation to the thorax and lower spine. The status may be determined by discovery of whether a positive Beevor's sign is present. If the umbilicus moves toward a viable segment of the abdominal musculature, positive fixation of the pelvis is lacking. If no action at all is present in the abdominal muscles, stabilization is also lacking. In the presence of either condition, it is impossible to estimate correctly the action of the leg muscles in relation to total performance. The use of physical therapy over a prolonged period (even though some individual leg muscles show improvement) will not lead to the desired stabilization. In fact, con-

Director of Education and Rehabilitation, Orthopaedic Hospital, and Emeritus Chief of Staff.

1. Carroll, R. L.: Rate and Amount of Improvement in Muscle Strength Following Infantile Paralysis, Phys. Therapy Rev. **22**: 243-257 (Sept.-Oct.) 1942.

tinued training of leg muscles in the presence of such abdominal weakness only tends to increase the gap in the kinetic chain and to provoke trunk deformity. Similarly proper fixation in the shoulder girdle must be provided to give good performance of the upper extremities. There the rhomboids, lower trapezius, serratus, and deltoids are most important. Continuance of intrinsic training of arm muscles in the presence of paralyzed fixators of shoulder girdle is a waste of time. Performance will remain limited unless repair is made.

Early surgical intervention directed toward attainment of the all-important trunk fixation will not only shorten treatment time by many months, but will also hasten the date of maximum performance. When the signs mentioned above are clear, repair at any time from the third to fourth month is none too early. Such intervention will save the time spent in hospital or convalescent home and the time of all persons involved in the care of the patient. Cost of hospitalization and physical therapy will be sharply reduced.

It should be stressed that many operations, especially those involving invasion of growing bone, are advisable only when a roentgenogram demonstrates the appropriate time. But certain tendon transplants, soft tissue surgery, such as that in the hand to improve opponens function of the thumb, can safely be done early. Early operation should also be resorted to if indications are clear that deformity is impending. In the presence of strong overactive or normal opponents to weak or inactive muscles, conservative physical therapy treatment should not be long continued. The discrepancy cannot be overcome by such means. Electromyographic studies show that muscles graded zero, trace, or poor do not recover, even with two years of treatment.

The record on the muscle chart does not necessarily give a complete picture, and the parents must be given to understand that it is only a guide to be used in execution of the plan previously explained.

An example is a girl, 6, with a dangle foot and no quadriceps function. The child wore a full length brace with locked knee joint to prevent a contracture deformity at the knee. For six months the monthly muscle chart showed overacting hamstrings and no quadriceps function. Since hip joint control was good, I did a biceps-to-patella transplant. This permitted cutting down the brace to a short below-knee size to control the foot and changed stiff-legged action to hip and knee action. Three months after operation the child could go up and down stairs normally. Of what use would it have been to have continued this child on exercises for 12 to 16 months? It was evident from the beginning that this operation finally would have to be done.

Another example is a boy, 9, whose bone structure of the foot showed good development. Muscle checks continuously showed strong gastrocnemius and peronei but wholly inadequate anterior and posterior tibialis. By the eighth month the surgeon saw that a subastragalar stabilization followed by transplant of one or both peronei would be necessary. These operations were successfully done and months of unnecessary physical therapy avoided.

If the parents have been made to realize that a careful plan of total care has been set up which will save time, work, and funds for all concerned, they will accept more willingly desirable changes from one modality of treatment to another and be ready to cooperate when the recommendation for surgery is made. If they understand that a return to reeducational exercise after each surgical procedure will be necessary, they will realize that prolonged exercise before operation is a duplication of effort. If they also understand that operations devised to correct imbalances of essential basic fixators are vital to performance, they will accept more readily necessary operations to foster speedier improvement of function.

Auxiliary workers, particularly physical therapists, sometimes encourage unwise continuance of physical therapy, and since practitioners who are not well versed in the care of poliomyelitis patients depend greatly on the therapist's view of the case, the physical therapy phase may be continued over a wholly unnecessary amount of time.

As another economy, effort should be made to train parents, public health personnel, and volunteer helpers to take over some home physical therapy treatment of poliomyelitis patients. If a weekly or biweekly treatment is given by the physical therapist at the clinic, mild paralytic, paretic, and nonparalytic patients usually do well under supervised home care. Muscle checks each fourth to eighth week will show whether or not progress is being made.

SUMMARY AND CONCLUSIONS

My recommendations are (1) an over-all plan for the patient through all stages of treatment with evaluation of the physical therapy aspects of care; (2) a thorough evaluation of performance, especially in relation to trunk muscle imbalance and potential deformity factors; (3) early surgical reconstruction when necessary and advisable; (4) an all-around increased effort to conserve patients' and workers' time and personal and institutional funds by increase in the tempo of care of poliomyelitis patients to the highest point commensurate with careful consideration of the needs of each patient.

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Periarteritis Nodosa.—Perhaps the most serious allergic disorder, in that it accounts for most deaths, is periarteritis nodosa. This arterial necrosis occurs in a few cases of intractable bronchial asthma; it accounts for death from serum sickness and is caused frequently by drugs, particularly sulfonamides. Although in many instances no evidence of allergy is evident, its appearance both clinically and experimentally as an expression of hypersensitiveness identifies it as an important allergic disorder. Without doubt the disease is encountered far more frequently than heretofore. . . . Doubtless much of the increase in incidence of the disease is due to sulfonamide drugs and their indiscriminate use.—Harry L. Alexander, M.D., Allergy, in Medicine of the Year, Philadelphia, J. B. Lippincott Company, 1951, page 35.

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TARSAL ANOMALIES AND PERONEAL SPASTIC FLATFOOT

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and
William M. Roberts, M.D., Gastonia, N. C.

Recent literature on the etiology of peroneal spastic flatfoot, especially by Harris and Beath,[1] has stressed the role of congenital abnormalities in this condition. Sloman [2] in 1921, and later Badgley,[3] observed the association of fusion of the anterior process of the calcaneus to the navicular bone with this condition, though anatomically the anomaly had been described earlier.[4] A second type of tarsal anomaly, namely, a union between the talus and the calcaneus in the region of the sustentaculum, has been held by Harris and Beath to be a commoner and heretofore unrecognized cause of rigid flatfoot. These authors reported a group of 17 cases of peroneal spastic flatfoot in which 88% were the result of tarsal anomalies. Twelve consisted of a talocalcaneal bridge in the region of the posterior end of the sustentaculum tali, and three were calcaneonavicular bars.

Since the above report was published, we have been taking special roentgenographic projections on all cases with peroneal spastic flatfoot. These consist of a posterior oblique view of the heel, with a downward and foreward projection angle amounting to 45 degrees for visualization of the sustentacular joint, and an oblique view of the midtarsal region to demonstrate the calcaneonavicular bar. These views are most important in addition to the routine X rays since the anomalies cannot generally be demonstrated without them. As a result we have found anomalies in 14 of the 21 cases of peroneal spastic flatfoot. Eight of these cases consisted of calcaneonavicular bars, four bilateral and four unilateral; four of a talocalcaneal bridge, three bilateral and one unilateral; and two of both of these anomalies, both of which were unilateral. Thus, tarsal deformity was the etiological factor in two-thirds of our cases. The frequency of these anomalies has been overlooked due to the requirement of special radiographic projections for their visualization.

The cause of most cases of spastic flatfoot has been explained on the basis of reflex peroneal muscle spasm secondary to some irritative focus of the tarsal joints.[5] Organic changes as a cause of spastic flatfoot in children generally have been considered uncommon. Certainly the association of bony abnormalities with spastic or rigid flatfoot has been completely ignored by the majority of authors, with only a few exceptions.[6] Rheumatoid arthritis with deformity and rigidity of the foot may early simulate spastic flatfoot, but it is a distinct entity. The common underlying cause of the usual spastic foot appears to be the presence of tarsal abnormalities and the fusion of the calcaneus to the scaphoid and to the talus. This is particularly true of resistant and recurrent cases, and careful examination of these feet reveals a limitation of mobility even after subsidence of the acute episode. It is true that because of the relative rigidity of the foot there is some adaptive shortening of the peronei, but definite evidence of peroneal spasm can usually be demonstrated in children when they have complaint. This is especially true in the type caused by the presence of a calcaneonavicular bar.

Many of these feet do not show depression of the longitudinal arch associated with valgus deformity, and in some even the valgus of the heel is absent, but the foot is relatively rigid and the forefoot everted. It has been a common previous observation that many of these so-called peroneal spastic flatfeet have not had a depression of the longitudinal arch and have frequently been unilateral. Most of such feet, we feel, would exhibit one or both of the tarsal anomalies here described if a thorough search were made for them.

THE CALCANEONAVICULAR BAR

This anomaly consists of a union between the anterior process of the calcaneus and the navicular. It may consist of a complete bone bridge (synostosis), a dense fibrous tissue bond (syndesmosis), or a cartilaginous bond (synchrondrosis). Pfitzner [4a] suggested that the anomaly resulted from fusion of a rare accessory tarsal bone, the calcaneus secondarius, to the calcaneus and the navicular. This anatomical study was published some 50 yr. ago.

Anomalies of this nature always exhibit restriction of lateral tarsal motion which may be proportional to the degree of osseous fusion. It is noteworthy, however, that the foot may not be flat in the sense that the longitudinal arch is flattened and the head of the astragalus depressed. The foot may be rigid though and held in valgus position due both to the anomaly and to the secondary peroneal spasm.

The onset of complaint is usually around the age of puberty or shortly before, during the active period of skeletal growth of the foot. As suggested by Badgley, the anomaly probably influences the functional structure of the tarsus most at that time. Generally these feet have manifested some degree of rigidity since early childhood. Minor trauma may initiate the symptoms of painful spasticity. Examination of these feet shows, in addition to the peroneal spasm and the limitation of inversion-eversion mobility of the forefoot, localized tenderness over the region of the calcaneonavicular bar. Rest will cause the

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This article has been abbreviated for publication in THE JOURNAL by omission of figures 1, 3, 5, 8, 10, 12 and 14. These will appear in the authors' reprints.

1. Harris, R. I., and Beath, T.: Etiology of Peroneal Spastic Flat Foot, J. Bone & Joint Surg. (no. 4) **30B**: 624, 1948.
2. Sloman, N. (1921): On Coalitio-Calcaneonavicularis, J. Orthop. Surg. **3**: 586, 1921.
3. Badgley, C. E.: Coalition of the Calcaneus and the Navicular, Arch. Surg. **14**: 75 (July) 1927.
4. (*a*) Pfitzner, W.: Beiträge zur Kenntniss des menschlichen Extremitätenskelets: VII. Die Variationen im Aufbau des Fusskelets, in Schwalbe, G.: Morphologischen Arbeiten, Jena, G. Fischer, 1896, vol. 6. (*b*) Dwight, T.: A Clinical Atlas: Variations of the Bones of the Hands and Feet, Philadelphia, J. B. Lippincott Company, 1907.
5. Lapidus, P. W.: Spastic Flat Foot, J. Bone & Joint Surg. **28**: 126, 1946.
6. Magee, R., and Benson, R.: Calcaneo-Scaphoid Bar, Canad. M. A. J. **55**: 287, 1946.

peroneal spasm to subside, after which the relative rigidity can be demonstrated. In younger children about the age of puberty the subastragalar motion may be only moderately limited. Abnormal stress on the midtarsal joint as a result of fixation of the bar brings about arthritic changes the most notable of which is an osteophytic lipping of the dorsolateral margin of the head of the astragalus. Harris and Beath state that this is invariably associated with these anomalies. While this is generally true, some of our younger cases did not show these changes while others not having congenital anomalies exhibited severe development of osteophytes. Likewise, older patients with these anomalies, but without symptoms, failed to show any evidence of tarsal arthritis. However, all the older symptomatic cases manifested this change on x-ray.

This anomaly may be unilateral or bilateral and may form a complete osseous bar uniting the calcaneus and navicular, or the bar may be incomplete with a connecting bond of fibrous tissue or cartilage (fig. 1).

CASE HISTORIES

Again, referring to Harris and Beath, these authors felt that, in contrast to the talocalcaneal bridge, the calcaneonavicular bar might be present without producing

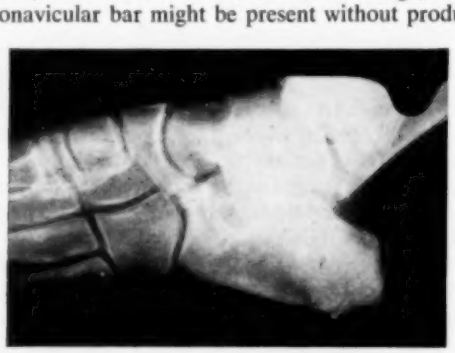

Fig. 2.—Lateral oblique view of the right foot (case 1) showing the calcaneonavicular synchondrosis. There was no arthritic change evident on lateral projection. This was an 11-yr.-old boy with similar anomalies in both feet.

either deformity or disability. Probably the same holds true for both conditions since one of our cases of a talocalcaneal bridge had no symptoms, though in all cases there was limitation of mobility. The symptomatic types of calcaneonavicular anomaly have been grouped into syndromes. (1) Those with long-standing complaint originating in early childhood. The deformity need not necessarily be severe, but persistent pain and weakness characterize this type. The rigidity of the foot, especially forefoot, is unremitting. (2) Those without symptoms or deformity (other than some valgus position of the heel, perhaps, and some restriction of the inversion-eversion movements of the forefoot) until the patient suffers a wrenching injury to the foot. The peroneal spasm and rigidity may subside on conservative measures over a period of time, but the inversion-eversion movement of the tarsus is never of normal degree. These patients may become asymptomatic insofar as the pain and spasm are concerned but remain susceptible to exacerbation on future trauma. (3) Those in which there may be actual fracture of the bar. This is theoretically a possibility but has never been demonstrated. It might be better to classify as a third syndrome those patients who have had no known complaint in previous childhood, but who develop onset of symptoms shortly before puberty and in whom the disability persists. In general the majority of cases date onset around the age of 9 or 10 yr. Some of the syndromes and variations can best be illustrated by the following case histories.

CASE 1.—*Bilateral Calcaneonavicular Synchondrosis.*—An 11-yr.-old white boy had foot complaints since the age of 7 yr. Because of continued stiffness and intermittent pain he was unable to run or play ball. Two weeks prior to his hospital admission he was unable to walk after a moderately long hike. Interestingly, this patient exhibited a definite varus tilt in the heels in weight-bearing, and he overran his shoes on their outer borders (fig. 3). Most of the varus tilt was on the right. Because of this he had been treated for some time with outside wedges to his shoes, but he never had complete relief from any type of support.

Physical examination revealed bilateral varus position of the heels with weight-bearing, especially on the right, and marked limitation of inversion-eversion motions of the forefoot. Repeated attempts passively to invert the foot resulted in peroneal spasm and rigidity of the foot. Passively, mobility of the os calcis was quite free bilaterally, though not of normal degree. Passive abduction of the forefoot caused pain in the region of the bar, and the patient was tender locally over that area. Roentgenograms showed a calcaneonavicular bar on the oblique view which was incomplete bilaterally (fig. 2). There was no evidence of osteoarthritic changes, and posterior oblique views revealed normal subastragalar joints.

Treatment consisted of excision of the bars. Under anesthesia relaxation of the peronei was obtained, and the feet could be inverted slightly beyond neutral position. There was, however, still marked limitation of motion. Upon direct visualization the bars were observed to possess a joint close to the base of the scaphoid. Each joint area was surrounded by a fibrous capsule, and minimal motion was noted on passive inversion-eversion movements of the feet. Midtarsal mobility was very limited. The bars differed somewhat in that the left one had a broader triangular base from the os calcis and projected anteromedially to a prominence of the lateral base of the scaphoid at an angle of about 55 degrees, while the bar on the right projected fingerlike at almost a right angle from the os calcis. Sections taken through the joint in the bar are shown in the photomicrograph (fig. 4).

Immediately after excision of the bars the feet could be passively carried through a normal range of inversion and eversion. The peroneal tendons did not cause any restriction, nor did they feel abnormally taut (fig. 3).

This case falls into the first syndrome. Resection of the bars was carried out because of the duration and severity of symptoms without evidence of arthritic changes or involvement of the subastragalar joints. In those cases with secondary osteoarthritic degeneration and restriction of subastragalar mobility a triple arthrodesis is preferable. In the five cases reported by Badgley resection of the bar was done in one and a subastragalar triple arthrodesis in another. Both operated cases had satisfactory results after a limited follow-up period. We feel that if arthritic changes are present or if there is an associated anomaly of the subastragalar joint, or both, then arthrodesis is the treatment of choice.

CASE 2.—*Unilateral Calcaneonavicular Synchondrosis.*—A 14-yr.-old white boy turned his right ankle while running. Pain and stiffness of the foot persisted much longer than would be expected from a simple inversion sprain. He had had no previous complaints with his feet. Examination revealed moderate peroneal spasm with tenderness distal to the anterior talofibular ligament which corresponded to the site of the calcaneonavicular bar. There was marked limitation of lateral tarsal motion, and repetitive inversion movements of the foot threw the peronei into strong spasm so that subsequently no inversion could be

performed passively. There was a good longitudinal arch to the foot, though the heel was slightly pronated. The Achilles tendon was not tight. The left foot was normal.

Conservative therapy was instituted which consisted of absolute rest from weight-bearing and whirlpool baths. The patient became asymptomatic after one month of treatment and has remained so to date, though lateral tarsal mobility of the right foot as compared with the left is limited. Roentgenograms revealed a calcaneonavicular bar on the right which was incompletely united (fig. 5). There were no other anomalies and no arthritic changes present.

This case illustrates the second syndrome which can be explained as caused by avulsion of the bar at the region of fibrous or cartilaginous union. A similar case was seen in which the patient had no complaints four years following the original acute episode. He had bilateral incomplete bars and was asymptomatic on recent examination, though his feet showed limitation of tarsal mobility. Also, there was no evidence of tarsal arthritis.

In general, feet possessing this anomaly show, with exception, some valgus position of the heel, though the longitudinal arch may or may not be depressed. There is limitation of the inversion-eversion movements of the foot. Subastragalar motion is not limited to the degree of midtarsal mobility unless there is secondary arthritic change or an additional talocalcaneal bridging. During acute episodes there is localized tenderness and pain over the region of the calcaneonavicular bar. Arthritic changes of the tarsal joints are frequently first manifested by osteoarthritic lipping of the dorsolateral margin of the head of the astragalus. This is proportionate in severity to the degree of valgus position and depression of the arch rather than to the completeness of osseous union of the bar.

THE TALOCALCANEAL BRIDGE

This tarsal anomaly consists of a bridge of bone spanning the subtalar joint and uniting the calcaneus with the talus immediately behind the sustentaculum. It may consist of a complete solid bony bridge (synostosis talocalcanea), or it may be incomplete with a fibrous bond (syndesmosis) or cartilaginous bond (synchondrosis) between the calcaneus and talus. An accessory joint may even exist. This has been attributed by Pfitzner and other anatomists to be the result of fusion of an accessory tarsal bone, the sustentaculum tali, to the astragalus and os calis. It occurs, when present, at the posterior end of the sustentaculum tali. The bridge may be united in part by cartilage and in part by bone.

In these cases there is fixation of the talus to the calcaneus, and the heel resists subastragalar motion. Osteoarthritic lipping usually is present on the dorsolateral margin of the head of the astragalus and is present more often in younger patients than in those with the calcaneonavicular bar. There is some valgus position of the heel, but the longitudinal arch may or may not be depressed. On careful clinical examination an abnormal fulness may be noted posterior and inferior to the medial malleolus at the site of this bony mass. Harris and Beath feel that this anomaly probably always causes deformity and disablement, but a patient in one of our cases had no complaints though the foot was in slight valgus position and moderately rigid. Again, complaints may arise about the age of puberty or in earlier childhood. Also, this anomaly has been found to occur in more than a single member of a family. Two cases of this anomaly studied in this series occurred in sisters, and they gave a history of an uncle who exhibited similar deformity, though he was not available for examination.[7]

CASE 3.—*Bilateral Talocalcaneal Synchondrosis.*—A 19-yr.-old white girl began to complain of her feet at about the age of 10 yr. The onset of her foot trouble accompanied minor trauma when she injured herself jumping from a height of several feet. Since then she has had increasing intermittent pain, swelling of the feet, and a tendency to "give way" in both ankles. At times the feet would become very rigid, and she could not invert them to any degree.

Physical examination revealed a good longitudinal arch bilaterally, though there was moderate pronation of the heels. Subastragalar motion was fixed, and the inversion-eversion movements of the foot were markedly limited. There was no peroneal spasm at the time of examination, though the patient stated that at times when she had pain in the feet they were held in valgus position and could not be inverted to the present degree. Most notable was a bony protuberance posterior and inferior to the medial malleolus which was due to the abnormal talocalcaneal union (fig. 6). This was not tender locally, but forceful passive joint motion caused pain in the region of the bridge.

Treatment in this case was subastragalar triple arthrodesis. The mass was excised from the medial aspect of the foot, and the synchondrosis is well demonstrated on microscopic section (fig. 8).

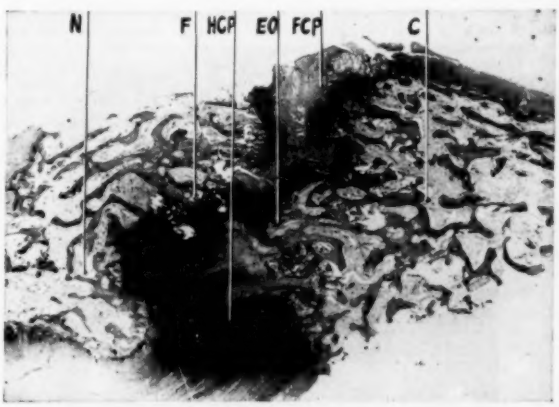

Fig. 4.—Low-power magnification of microscopic section taken through excised calcaneonavicular bar seen in roentgenogram of foot in figure 2. Two masses of essentially normal-appearing bony trabeculae; one from the anterior process of the calcaneus (*C*) and the other from the navicular (*N*) are separated by a plate of hyaline (*HCP*) and fibrocartilage (*FCP*). There is active endochondral ossification (*EO*) along the margins of the plate and areas adjacent to the cartilage in which the bone marrow is fibrotic (*F*). (Histological sections are from the Department of Pathology, Charlotte Memorial Hospital, Charlotte, N. C., by courtesy of Dr. Paul Kimmelstiel, pathologist).

In this case the anomaly could be identified on the lateral and anteroposterior roentgenograms, which ordinarily is not possible. It demonstrates very clearly the position of the talocalcaneal bar posterior to the sustentaculum tali (fig. 7). The anomaly in this case exhibited a familial tendency. The 26-yr.-old sister of this patient had an identical condition without any complaint except for an occasional "aching" in the calves (fig. 9).

With this anomaly complaint is usually of early onset, or the foot may remain entirely asymptomatic. The asymptomatic foot does not seem to possess the susceptibility to trauma that occurs in some cases of calcaneonavicular bar, and the symptomatic foot does not respond to conservative therapy as do, in certain instances, cases of other foot anomalies. Neither anomaly is peculiar to race.

7. These were patients of Dr. Julian Jacobs of the Miller Clinic, Charlotte, N. C. and were studied and presented with his permission.

ROENTGENOGRAPHIC FEATURES

The position of the talocalcaneal bridge posterior to the sustentaculum tali as described anatomically is well illustrated by figure 7. Sometimes the synchondrosis can be distinguished as a thin serrated line of decreased density between the bone masses. This serrated margin

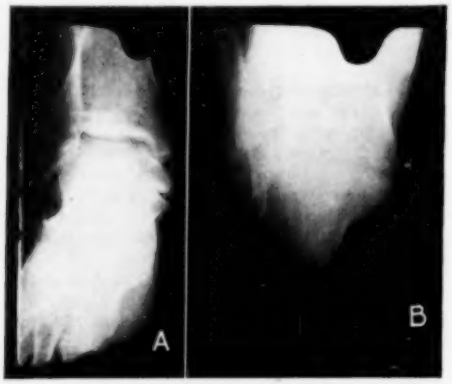

Fig. 6.—Talocalcaneal bridge of the left foot (case 3) showing the anomaly inferior to the medial malleolus on a routine anteroposterior view of the ankle (*A*). This film is reversed for better comparison with the posterior oblique view (*B*) of the same anomaly.

has also been described anatomically and may be apparent on lateral films of the foot (fig. 10). On the posterior oblique view the bone mass and line of synchondrosis are visualized inferior to the level of the normal sustentacular ledge and joint line as they lie posterior. The abnormal bone mass is of greater magnitude than the normal sustentacular process, and at times the line of

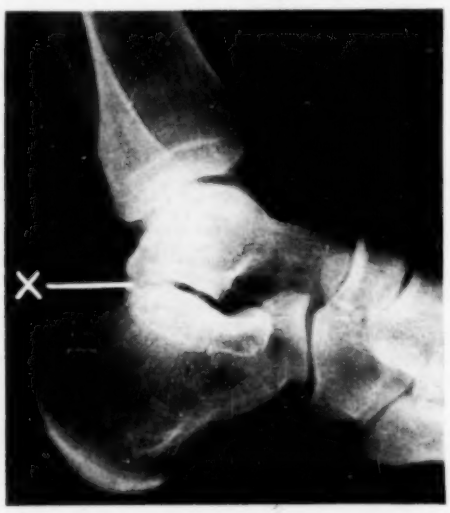

Fig. 7.—Lateral view of the foot shown in figure 6. The talocalcaneal synchondrosis can be identified as a narrow serrated line posterior to the sustentaculum tali. The anomaly cannot usually be demonstrated on a routine lateral film.

synchondrosis is directed inferiorly and medially (fig. 11). There may also be a varying degree of osseous union.

The lipping of the dorsolateral margin of the head of the talus may or may not be evident early, but it is more frequently observed in cases of talocalcaneal bridge than in cases of calcaneonavicular bar. Arthritic lipping is especially significant of tarsal anomaly when it is in combination with a good longitudinal arch and a young foot (fig. 11). Similar changes may occur in severe flatfeet without anomalies. In unilateral cases of these anomalies a severe flatfoot on the opposite extremity may show a greater degree of arthritic change and deformity of the arch than the side with the congenital abnormality. The symptoms are greater, however, on the side with the anomaly. The relative rigidity of the foot probably accounts for the lesser degree of tarsal arthritis in such cases. The symptoms are not proportionate to the extent of the osseous union of the anomaly. Also, tarsal arthritis in feet possessing these anomalies is not a prerequisite for complaint, yet no asymptomatic foot in our series revealed evidence of degenerative arthritis.

MICROSCOPIC FEATURES

The majority of these anomalies possess an area of synchondrosis. Microscopic studies reveal cartilaginous plate consisting of both fibrous and hyaline cartilage between the anomalous bone masses which are composed of normal trabeculated bone. The plate is of varying

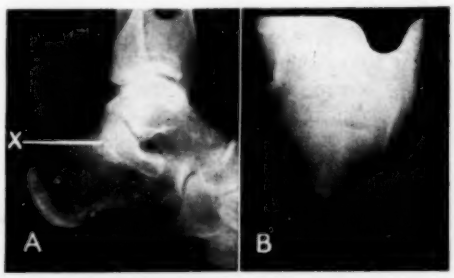

Fig. 9.—Lateral (*A*) and posterior oblique (*B*) roentgenograms of a foot of the sister of a patient in case 3 (fig. 6 and 7). This was a 26-yr.-old woman with bilateral talocalcaneal anomalies who had never had complaint with her feet, though they were relatively rigid. There is no evidence of tarsal arthritis, and, generally, the feet are almost identical to those in case 3, though there is a greater degree of osseous union of the talocalcaneal bridge.

width and usually shows evidence of active transformation into osteoid and bony material along the margins where it is in direct continuity with the adjacent bone (fig. 4 and 8). Thus, with increased ossification with age one might expect complete obliteration of the plate of cartilage through ossification. In the series of cases presented here all those under the age of 14 exhibited a synchondrosis. The width of the plate generally was indirectly proportional to the age. This is illustrated in two of the older patients with calcaneonavicular bars. The one, 22 yr. of age, had an incompletely ossified bar (fig. 12). The other, 24 yr. of age, had a completely ossified bar (fig. 1).

Trauma with callus formation is a second process ossifying the plate. Injury to the plate can explain the localized complaint common with these anomalies and is, in addition to the arthritic degenerative changes, a cause of symptoms. In the cartilaginous plate areas may be found which show necrosis of cartilage and the formation of clefts (fig. 14). These degenerative changes are interpreted as the result of trauma. In young patients with a talocalcaneal bridge a mixture of chondrous and osseous union is frequently observed. This probably is due

largely to callus formation (fig. 13). Such an interpretation can explain the clinical observation that this anomaly, once it has become symptomatic, does not respond to conservative therapy. The role of trauma is more prominent due to the subastragalar position of the talocalcaneal bridge.

There was no evidence of an accessory bone in any of these cases. The presence of separate bone masses is much uncommoner than these anomalies.[8] We have seen one case in addition to this group of calcaneonavicular and talocalcaneal anomalies with a separate area of ossification. This was a case in which the sustentaculum tali was partly adherent to the talus and did not restrict tarsal mobility or cause symptoms (fig. 15). Thus, the os secondarius and sustentaculum tali are probably a part of the same abnormal process since studies on the fate of other accessory tarsal bones, such as the accessory scaphoid, have shown that fusion occurs between that bone and the scaphoid in a large proportion of such cases in which a separate accessory bone was roentgenographically demonstrated.[9]

Another occasional tarsal bone, the talus accessorius, may also contribute to the formation of the talocalcaneal

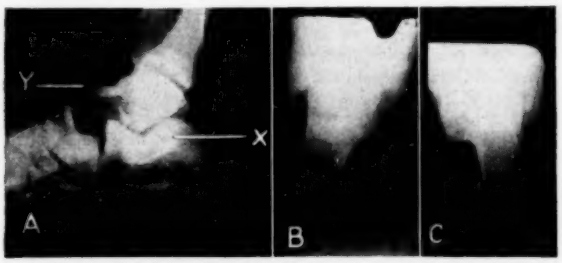

Fig. 11.—Osteoarthritic lipping of the head of the talus in the presence of a high longitudinal arch in the foot of a 13-yr.-old girl with a talocalcaneal synchrondrosis. The anomaly is not well visualized on the lateral film (*A*), though the narrow space marked by *X* between the posterior margin of the sustentaculum and the talus is suggestive. A normal talosustentacular joint is shown (*B*) in contrast with the anomaly as visualized from a posterior oblique view (*C*).

union. This is suggested by the position and magnitude of the anomaly as frequently encountered. In addition, the frequent occurrence of the area of synchondrosis in the inferior portion of the abnormal bone mass suggests primary osseous union with the talus.

TREATMENT

In the treatment of spastic flatfoot the early recognition of tarsal anomaly as the etiological factor in its production is important. The plan of therapy varies somewhat depending upon the anomaly, the type of syndrome, the age of the patient, and the degree of secondary arthritic involvement.

Conservative Measures.—These are primarily reserved for cases which have only an occasional complaint following trauma and for cases of symptomatic talocalcaneal anomalies in children too young for arthrodesis of the foot. The former cases consist of those with a calcaneonavicular bar exhibiting the second type of syndrome. In these absolute rest of the foot, aided perhaps by whirlpool baths, will cause the acute symptoms of spasm and fixation to subside, but treatment is required over a moderately long period of time and normal flexibility of the foot is never obtained. Consistent support is maintained through the use of firm rubber arch pads. Plaster immobilization under anesthesia is of value since it allows maximal relaxation of the peronei and maintains support of the foot, though usually the same result may be accomplished through rest and whirlpool baths. Manipulation in itself is of no value and actually may be

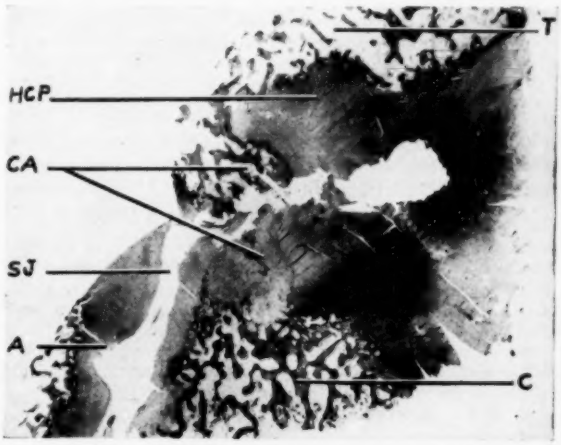

Fig. 13.—Low-power magnification of microscopic section taken through the excised talocalcaneal anomaly of the foot whose roentgenograms are reproduced in figure 10. A hyaline cartilage plate (*HCP*) separates the bone mass of the talus (*T*) from that of the calcaneus (*C*). There is an area of callus (*CA*) in which there is formation of osteoid and bony material extending across the cartilaginous plate at its medial border. This lies between the remaining lateral portion of the cartilage of the synchondrosis and the sustentacular joint (*SJ*). The defect in the articular cartilage (*A*) of the joint is the site of degenerative arthritis.

harmful. The rigidity resulting from the anomalies themselves after release of the peroneal spasm does not further improve under anesthesia, and forcing correction is either futile or causes additional injury to the region of congenital abnormality which was the exciting factor originally.

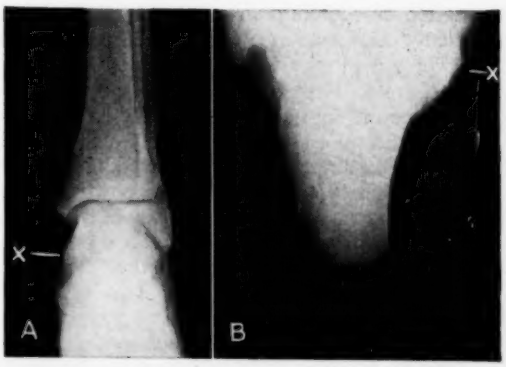

Fig. 15.—Sustentaculum tali (*A*) present in an asymptomatic foot. This was a 20-yr.-old athlete who exhibited only slight valgus position of the involved foot without any restriction of subtalar motion, arthritic changes, or previous complaint.

Surgical Measures.—(1) Calcaneonavicular bars: In young children and feet without arthritic changes the bar

8. Burman, M. S., and Lapidus, P. W.: The Functional Disturbances Caused by the Inconstant Bones and Sesamoids of the Foot, Arch. Surg. **22**: 936 (June) 1931.

9. Zadek, L., and Gold, A. M.: The Accessory Tarsal Scaphoid, J. Bone & Joint Surg. **30A**: 957, 1948.

should be resected as early as it is recognized (fig. 16). These feet may be subject to recurrence of painful spasticity if unrecognized subastragalar changes are present, however, and a triple arthrodesis will then be required. In older cases with arthritic degeneration and rigid, deformed flatfoot, arthrodesis is the procedure of choice. (2) Talocalcaneal bridge: Arthrodesis is the treatment if symptoms warrant it and should be done as soon as osseous development of the foot permits it.

SUMMARY

The commonest cause of peroneal spastic flatfoot is tarsal anomaly consisting of a calcaneonavicular bar or a talocalcaneal bridge. Either or both anomalies may be present. Such feet exhibit some degree of rigidity even when without symptoms. However, in children during acute episodes peroneal spasm in addition is present which holds the foot in rigid fixation. Most of these feet show some degree of valgus position, though in many there may be no depression of the longitudinal arch. In the latter type foot tarsal arthritis with lipping of the dorsolateral margin of the head of the talus is significant of congenital anomaly. The presence of these abnormalities has been overlooked because of the difficulty of visualization on routine roentgenography. These anomalies usually possess an area of synchondrosis, the cartilage of which is progressively transformed into bone to varying degrees. Formation of bone through callus probably accounts for the early osseous fusion frequently found with the talocalcaneal bridge. Treatment is dependent upon the anomaly, the type of syndrome, the age of the patient, and the degree of secondary arthritic change. Early recognition of the etiology of the peroneal spastic flatfoot influences the treatment and prognosis.

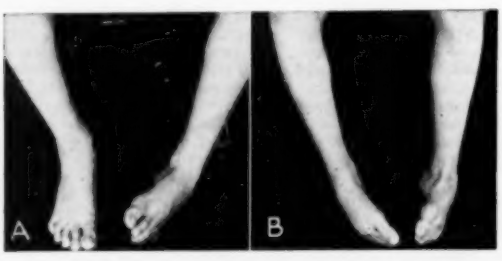

Fig. 16.—Eleven-year-old boy with a calcaneonavicular bar in the right foot who illustrates the third type of syndrome. Rigid valgus position of the right foot is shown in (*A*) before surgery. The release of tarsal rigidity is brought out by the postoperative photograph (*B*).

1108 Sharp Building (Dr. Webster).

ABSTRACT OF DISCUSSION

DR. EARL D. MCBRIDE, Oklahoma City: Dr. Webster and Dr. Roberts have added further convincing evidence that the congenital anomalies between the calcaneus and astragalus, or calcaneus and scaphoid, may be specifically responsible for the clinical phenomenon known as spastic flatfoot. They have mentioned that these deformities have been overlooked frequently, but I would say they simply have not been looked for. Constant stressing of the necessity for oblique roentgenographic views of children's feet may eventually improve the statistics. The feet of small children seldom present symptoms of pain, no matter how pronated or flattened the arches may appear. When the child does complain of his feet or legs, and when rigidity of the tarsal joints is at all present, some of these anomalies may be responsible. Such a foot should be followed into maturity with periodic roentgenograms. Spastic flatfoot is comparatively rare. It still is not known what percentage of feet with these intertarsal anomalies do or do not develop into peroneal spastic flatfoot. So far as I can recall over a period of 30 yr. good results have been obtained from closed, forcible manipulation of the peroneal spastic flatfoot, followed by six or seven weeks of immobilization in overcorrecting weight-bearing casts. Of course, the contour of the arches, in such cases, usually remains flattened, but the ultimate result is satisfactory when adequate support and exercises are applied. Dr. Webster did not say much about treatment; however, in his paper he does recommend surgery in many of these cases and removal of the anomaly. Too much enthusiasm for surgical removal of these anomalies, based on roentgenographic discovery, might lead to inadvisable and mutilating surgery. When removal of the anomaly is necessary, as in the presence of spastic flatfoot, it would seem advisable to proceed with fusion of a type which will correct the flatfoot. I would strongly stress against surgical meddling with a child's foot through enthusiastic curiosity. I feel that we should not become too enthusiastic about surgical treatment in these cases. I do think we should become more enthusiastic about x-raying of children's feet from the standpoint of these anomalies.

DR. CHARLES YOUNG, Los Angeles: I wish to bring out some of the background of tarsal anomalies and spastic flatfoot. Previous to 1900 all cases of flatfoot were put in the broad classification of flaccid or rigid. In 1905 Sir Robert Jones described an entity which he called peroneal spasm in flatfoot. As treatment he tenotomized the peroneal tendons and manipulated the foot with a Thomas wrench until it was flexible. Plaster was applied to maintain a position of inversion and adduction. There must have been relapses because, later, he recommended the excision of a ¾ in. section from the peroneal tendons to prevent them from reuniting. We know now that muscle spasm, and not adaptive shortening, is caused by arthritic changes in the foot. A decade later Jones described another entity which he called osseous flatfoot, the foot being in a rigid deformed position but without spasm of the peroneal muscles. He was misled by the presence of osteophytes on the superior margin of the talonavicular joint. These are the result of rigidity caused by tarsal anomalies, not by true osteoarthritis. Jones did not know the etiology of this osseous flatfoot, as we have heard it described today. I am in agreement with the treatment described by the essayists. Adults with calcaneonavicular bars which are painless require no treatment. Conservative treatment can be used in painful cases, unless the pain is persistent; then surgical intervention is necessary. Patients with talocalcanean bridges have more pain, do not respond well to conservative treatment, and usually require operations. When an arthrodesis is performed on the subtalo and calcaneonavicular joints, in severe cases, it should include the calcaneocuboid joint; otherwise, correction of the deformity is difficult after division of restraining soft structures, and a good result is not so sure. When these anomalies are discovered in childhood and conservative treatment fails, operations should be postponed until the teen-ages when, as determined by roentgenograms, the tarsal bones have almost completely ossified.

Swimmer's Itch.—Swimmer's itch, or schistosome dermatitis, is a water rash found in . . . the region of the Great Lakes. It is caused by penetration into the skin of flukes known as cercariae. It does not result in disease to humans but is objectionable because of the extreme discomfort it causes. . . . The causative organisms are found living in the tissues of common snails, from which they emerge daily during warm summer weather. Bathers are infected by accidentally capturing the organisms in drops of water on the skin and allowing them to penetrate. Once inside the skin, the defensive mechanism of the body destroys them, resulting in local irritation around each point of entrance. A severe itching or burning sensation is the result. Bathers may prevent penetration of the skin by these organisms by drying the body completely and briskly with a towel immediately on leaving the water, or by taking a shower in cercaria-free water before the beach water dries on the skin.—Theodore F. Wisniewski, Aquatic Nuisance Control, *Wisconsin Medical Journal*, June, 1951.

CRYPTOCOCCUS (TORULA) MENINGITIS

REPORT OF TWO CASES

Albert W. Cook, M.D., Brooklyn

Human cryptococcosis (torulosis) was first recognized as a clinical entity in 1914 by Versé.[1] Previous reports by Busse and Buschke,[2] Gilchrist,[3] and Curtis [4] at the end of the 19th century, however, indicate that they had actually described Cryptococcus infections in man but had not classified the yeast as Cryptococcus hominis (Torula histolytica). Since that time three monographs [5] and innumerable articles have appeared in the world literature describing the characteristics of human infestations with this organism, and to date approximately 200 cases have been reported.

Although acute forms of the disease have been known, typically human Cryptococcus infections are of a chronic nature and most commonly implicate the central nervous system and lungs. Isolated instances of recovery have been cited,[6] but death is the expected termination of the disease. No specific mode of therapy is known.

In spite of an increasing number of reports of this malady, few diagnoses have been made before death and, in fact, it is still considered a rare clinical entity unfamiliar to many physicians.

The purposes of this report are several: to record two additional cases, one being recognized before death, encountered in the wards of two general hospitals in 15 months; to call attention to the various manifestations of infection in the nervous system with the Cryptococcus organism, with its problem of diagnosis; to express the view that human torulosis may not be as rare a clinical problem as has been heretofore believed; and finally, to indicate various syndromes in which Cryptococcus infections should be considered instead of assuming the existence of some other process without positive substantiation.

CASE REPORTS

CASE 1.—J. W., a woman aged 58 years, was admitted to the Brooklyn Hospital under the care of Dr. Warren Huber, with the complaint of severe headaches for the previous 39 days. These headaches had appeared three days after a smallpox vaccination and were located at the vertex of the skull. Large doses of acetylsalicylic acid afforded no relief. Three weeks prior to admission she had noted that her speech was indistinct and that she had trouble forming words. Diplopia appeared shortly thereafter, and her vision had progressively failed up to the time of admission. Members of the family had also observed that she was increasingly more somnolent and that her vision seemed to be impaired when viewing objects on the left side. Gold circles had been seen in both the right and the left visual fields.

Examination.—The blood pressure, pulse, respiration, and rectal temperature were all normal. Neurologic examination revealed the following abnormalities: (1) enlarged left pupil which reacted promptly to light directly and consensually; (2) internuclear ophthalmoplegia; (3) nuchal rigidity and bilateral Kernig's signs; (4) a left homonymous visual field defect (confrontation); (5) bilateral papilledema; (6) marked error of projection in the performance of the finger to nose test bilaterally and to a less extent in the heel to knee test; (7) absent superficial abominal reflexes, and (8) bilateral signs of Babinski. There were no changes in sensation, muscle reflexes or in the function of any of the other cranial nerves. Her speech difficulty was primarily that of an inability to form words and enunciate correctly. She was able to obey visual and auditory commands promptly and accurately and all objects and their uses were appreciated correctly.

During the course of the examination her position was changed from a supine to a sitting attitude. Upon return to the former her condition changed suddenly. Her head turned from side to side, and vertical nystagmus was detectable. The left upper extremity was thrown over her head and when she was asked to touch her nose, her hand traveled in all directions, finally landing on her face with a thump. She said "I'm so sleepy, so sleepy all the time." In several minutes these signs disappeared and she became more lucid.

No abnormalities were found after a general physical examination except a fading maculopapular rash over her neck and shoulders. There was no local reaction at the site of vaccination. Roentgenographic examinations of the skull and chest were considered negative.

In view of the history of vaccination, a diagnosis of postvaccinal meningoencephalitis was entertained although the possibility of a chronic meningitis due to an organism such as the tubercle bacillus or C. hominis was considered by her physician.

On the day following admission, paresis of the right lower face and upper extremity appeared and a lumbar puncture showed clear and colorless cerebrospinal fluid under normal pressure. In order to exclude the slight possibility of a subdural hematoma, bilateral burr holes were appropriately placed. Since there was no evidence of recent or old subdural bleeding, air was introduced into the ventricular system and subsequent ventriculograms revealed no change in the size, shape, or position of the ventricles. The only significant finding was that of a large accumulation of cerebrospinal fluid within the subarachnoid space overlying the right cerebral convexity. On subsequent lumbar punctures the spinal fluid was yellow and contained from 200 to 350 cells, the greater proportion of which were mononuclear in type. The unusual large size of these cells prompted the laboratory technician to consult the clinical pathologist, who immediately appreciated their importance and after staining demonstrated numerous yeastlike bodies with gram-positive granules of varying size. The total protein and sugar contents of the spinal fluid were estimated on various occasions at 70 to 80 and 10 to 18 mg. per 100 cc., respectively. The colloidal gold curve was normal and the cerebrospinal fluid contained 763 mg. of chlorides per 100 cc. on one occasion. Culture of this fluid yielded a luxurious growth of C. hominis. The organism was then cultured on glycerin veal and Sabouraud's medium (incubated at room temperature for 18 hours) and found to be resistant to 100 Oxford units of penicillin and 1,000 units of streptomycin.

In spite of treatment with chemotherapeutic and antibiotic agents available at that time (before aureomycin, chloramphenicol and others), little improvement was noted in the patient's clinical course. Repeated spinal punctures continued to yield a

From the Brooklyn Hospital, and the United States Naval Hospital, St. Albans, N. Y.

The Department of Pathology, United States Naval Hospital, St. Albans, N. Y., gave permission for the use of their autopsy material, and the clinicians mentioned in the text made their case records available.

1. Versé, M.: Über einen Fall von generalisierter Blastomykose beim Menschen, Verhandl. d. deutsch. path. Gesellsch. **17**: 275, 1914; cited by Cox and Tolhurst, and Freeman.[5]

2. Busse, O.: Über parasitäre Zelleinschlüsse und ihre Züchtung, Zentralbl. f. Bakt. **16** (pt. 1): 175, 1894. Buschke, A.: Deutsche med. Wchnschr. 1895, W. Vereins Beilage, p. 14; cited by Benham.[7]

3. Gilchrist, T. C.: A Case of Blastomycetic Dermatitis in Man, Johns Hopkins Hosp. Rep. **1**: 269, 1896; cited by Cox and Tolhurst.[5]

4. Curtis, F.: Contribution a l'étude de la saccharomycose humaine, Ann. Inst. Pasteur. **10**: 449, 1896; cited by Cox and Tolhurst.[5]

5. Cox, L. B., and Tolhurst, J. C.: Human Torulosis: A Clinical, Pathological and Microbiological Study with a Report of Thirteen Cases, Melbourne, Australia, Melbourne University Press, 1946. Stoddard, J., and Cutler, S.: Torula Infection in Man, Rockefeller Institute for Medical Research, Monograph 25, 1916, p. 1. Freeman, W.: Torula Infection of the Central Nervous System, J. f. Psychol. u. Neurol. **43**: 236, 1931.

6. O'Neill, F. J.; Newcomb, A., and Nielsen, C. S.: Cryptococcus Meningitis, U. S. Nav. M. Bull. **49**: 300, 1949.

yellow fluid with an elevated total protein, a low sugar, and pleocytosis. She gradually lapsed into coma and died 21 days after admission to the hospital. Permission for an autopsy was not granted.

CASE 2.—E. A., a 19-year-old Negro youth, was first admitted to the hospital in June 1948, with the chief complaints of frontal headache and vomiting for the previous month. The headaches remained for a few hours and disappeared abruptly. At first

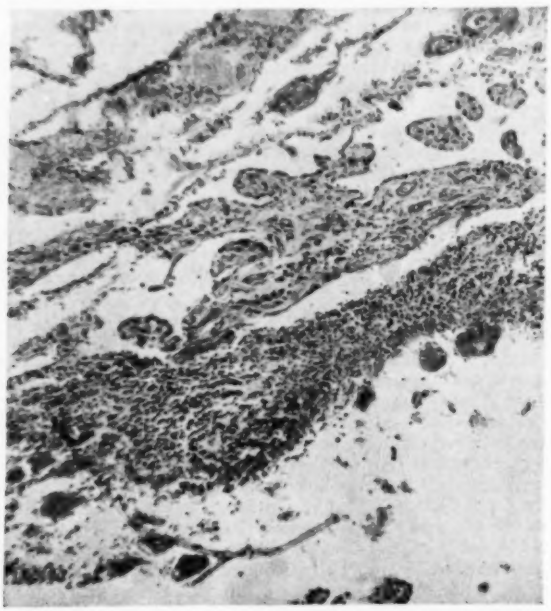

Fig. 1.—Granulomatous lesion and Cryptococcus organisms in the meninges. Hematoxylin and eosin; ×60.

there were no concomitant symptoms, but later nausea and vomiting and bilateral shoulder pain accompanied the attacks of headache. At one time numbness and tingling of the entire right upper extremity appeared but apparently remained for only a short time. Prior to the onset of these disturbances the only relevant symptom was that of staggering to both sides six months before entry into the hospital.

Examination.—The blood pressure, pulse, respirations, and rectal temperature were all normal. The patient was poorly developed, lethargic, and despondent. The only abnormal neurologic findings were a tendency to stagger to the right when he walked with his eyes closed and bilateral papilledema of 3 to 4 D. His neck was not stiff, and hyperextension of the head on the neck did not produce additional symptoms. There was no impairment of the function of structures innervated by any of the cranial nerves other than the changes noted in the optic nerves. Visual acuity was normal on both sides, but perimetric examination of the visual fields disclosed bilateral enlargement of the blind spots and a concentric contraction of both fields. There was a female distribution of pubic hair, no axillary hair, no chest hair, and no facial hair. An electroencephalogram was interpreted as being normal.

Because of the patient's age and the symptoms and signs of increased intracranial pressure, a posterior fossa neoplasm was suspected but a subdural hematoma was also considered. Trephination of both the temporal and the occipital areas bilaterally revealed only a brain under considerable tension, without evidence of subdural hemorrhage (Dr. William Druckemiller). The posterior fossa was then explored. Here a very thick opaque arachnoid was seen over an enlarged cisterna magna. This was incised and found to be adherent to the underlying cerebellar cortex and overlying dura. The cerebellar tonsils had not herniated through the foramen magnum, and after thorough exploration nothing suggestive of a neoplastic lesion was found.

On the first postoperative day the rectal temperature was 101 F., but it returned to normal in 24 hours. The patient vomited frequently and complained of pain over the right eye. Sensation, reflexes, and motor power in all extremities remained unaltered. Lethargy persisted. On the fourth postoperative day a lumbar puncture was done and the cerebrospinal fluid was found to be grossly bloody under a pressure of 288 mm. No organisms were found in the fluid. The headache, vomiting, and lethargy continued for the next two days; then the blood pressure and pulse began to fluctuate. His respirations were interrupted by periods of apnea. Subsequent lumbar punctures alleviated these symptoms temporarily but with each succeeding day he became less responsive. On the 21st postoperative day the rectal temperature was subnormal and he was incontinent of urine and feces. From this time to his demise he was unresponsive and moist rales were heard at both lung bases on the 29th postoperative day. The latter increased markedly in the next ten days until he died, on the 39th postoperative day. The final clinical diagnosis was adhesive arachnoiditis of the posterior fossa due to an unknown cause.

Autopsy Findings.—In addition to passive congestion of the viscera the pertinent findings were confined to the brain and lungs.

Lungs: The lungs weighed 600 Gm. together. The right lower lobe was firm and nodular and the pleural surfaces were covered with a fibrinous exudate. The cut surface was marked by irregular, elevated, granular areas from which purulent material could be expressed. Microscopic examination of this tissue revealed two circumscribed areas of caseous necrosis, one with a suppurative center and surrounded by epithelioid cells and fibrous connective tissue. A few oval, semitranslucent bodies with refractile capsules suggestive of cryptococcus organisms were noted. There was a severe purulent bronchopneumonia, and acid-fast stains did not reveal any organisms suggestive of the tubercle bacillus.

Brain: The cerebral convolutions were approximately equal in size, but all the gyri were tremendously flattened, with obliteration of the sulci. The pia-arachnoid over the convex surfaces of

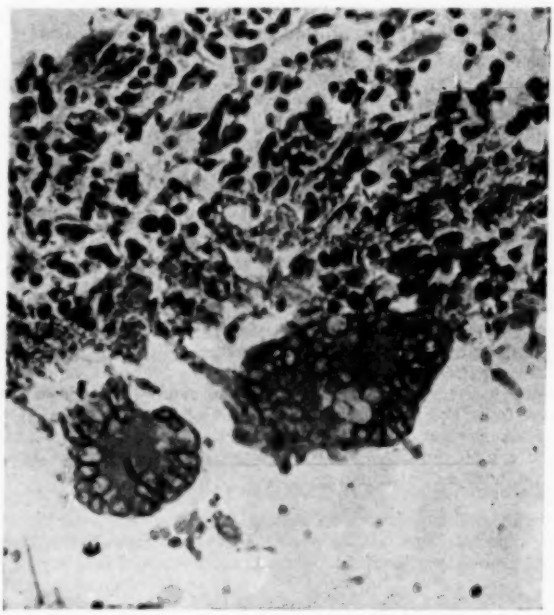

Fig. 2.—Granulomatous lesion and Cryptococcus organisms in the meninges. Hematoxylin and eosin; ×440.

the brain was thick and milky in appearance. There were dense adhesions between the cerebellum and the medulla, obliterating the foramens of Luschka and Magendie. Dense adhesions were found in the dura over the posterior surfaces of both lateral cerebellar lobes. On frontal section, the anterior horns of both lateral ventricles were greatly dilated, and the third ventricle moderately so. There were enormous dilatations of the posterior horns of both lateral ventricles and the aqueduct was moderately dilated. As one looked through the dilated fourth ventricle from

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anterior to posterior, the ependyma appeared granular and the foramina of Luschka were represented only by small depressions. There was no trace of the foramen of Magendie, and no communication could be found into the cisterna magnum. Microscopic examination of sections from the cerebellum and brain stem revealed an extensive and severe chronic granulomatous inflammation of the leptomeninges. The superficial layers of the brain were also involved in this process with several discrete lesions being placed at a much deeper level. The ependyma was similarly involved. The inflammatory process consisted of a poorly organized mixture of epithelioid cells, a few giant cells, plasma cells, lymphocytes, and an occasional polymorphonuclear leukocyte. Refractile spherical bodies with gelatinous capsules were found both within the giant cells and lying free in the exudate. Occasional small buds were noted on these organisms, which were very suggestive of C. hominis (figs. 1 and 2).

COMMENT

The sequence of events leading to the diagnosis of C. hominis infections in the central nervous system in these two cases is fairly representative of the experience of other authors. The clinical picture is, at first, confused with either meningoencephalitis from other causes, or subsequently, subdural hematoma and brain tumor are sought by trephination, ventriculography, and finally exploration. When, even after these procedures, the etiologic diagnosis is still not apparent, one must await the result of necropsy studies. Here, the great majority of diagnoses are made.

The crucial point in the antemortem diagnosis is, of course, the examination of the spinal fluid, and more particularly the isolation of the organism from this fluid. However, here there are many pitfalls. At times, as in the case of the first patient, the fluid may be clear and colorless when it is first examined, but most often it is yellow and has an elevated protein content. The organism, if thought of, may be easily visible and recoverable by culture,[7] yet even when visible it may be incorrectly reported as lymphocytes or red blood cells. In case 1 it was only because of the alertness of the laboratory technician in realizing that the cells he saw were unusually large that recognition by the clinical pathologist was possible. It can be readily appreciated how fortuitous this finding was, especially since an autopsy was not performed and undoubtedly the true diagnosis would never have been evident. When such cases appear in the younger age groups the common diagnosis is usually tuberculous meningitis even though an organism is never isolated. Similarly, in other cases of so-called chronic arachnoiditis, chronic serous meningitis and other vague forms of chronic meningitides, Cryptococcus infections should, at least, be considered. It is indeed significant that in the second patient the diagnosis was not evident until microscopic examination of the brain. In the past it was merely of academic interest to make such a differentiation, but with the ever-increasing availability of newer chemotherapeutic and antibiotic agents, it is incumbent upon the physician to attempt to substantiate his diagnoses in these cases from an etiologic standpoint so that a true evaluation of these new drugs can be made in diseases which are otherwise almost universally fatal.

SUMMARY

Two cases of Cryptococcus (Torula) meningitis are reported, one being recognized antemortem. The various manifestations and problems of diagnosis are mentioned and illustrated by the case reports. The view is expressed that human Cryptococcus infection of the central nervous system may not be as rare as is believed. Only future investigators will establish the value of searching for this organism in otherwise vague unsubstantiated chronic meningitides when the ever-increasing number of chemotherapeutic and antibiotic agents are used to combat it.

806 Carroll Street.

7 Benham, R. W.: The Fungi of Blastomycosis and Coccidioidal Granuloma, Arch. Dermat. & Syph. 30: 385 (Sept.) 1934.

TREATMENT OF ACNE VULGARIS

George C. Andrews, M.D., Anthony N. Domonkos, M.D.
and
Charles F. Post, M.D., New York

Stuart Way and one of us (G. C. A.) recently reviewed the literature of acne vulgaris with especial reference to hormone imbalance.[1] The present paper simply describes an experiment. Two years ago we decided to try to use for a year only antibiotics and estrogenic substances in treatment of acne vulgaris and not to employ X-ray irradiation.

We had up to that time achieved some good results with antibiotics, estrogenic substances, and other modern medicines. This small success made us wonder whether modern medical progress had reached a point where acne could be cured by these remedies. Our success during this first year of the experiment was so satisfactory to all that we have continued the experiment through the second year without any misgivings as to its superiority over the older methods of treatment in vogue five or 10 yr. ago.

Whereas prior to the beginning of this experiment X-ray treatment was routinely used in practically all cases of acne and was considered essential, it was suddenly discovered that without X-ray treatment just as good, if not better, results were achieved. Indeed our most interesting cases were those in which the patients had received long series of X-ray treatments before coming into our hands. It was in those cases of the nodular and cystic type that had not responded to X-ray treatment that our most gratifying results were achieved.

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This paper is the first in a "Symposium on Therapy," read before the Section on Dermatology and Syphilology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

1. Way, S. C., and Andrews, G. C.: Hormones and Acne: Clinical Evaluation of Hormonal Therapy in Adolescent Girls with Acne, Arch. Dermat. & Syph. 61: 575-588 (April) 1950.

The experiment was based upon certain concepts of fundamental importance. These concepts may differ from those generally held; they would not be worth reporting unless they did. We have, however, come to rely upon them as a result of our studies and experiences.

1. We assume that simple cases of oily seborrhea, comedones and papular acne (acne simplex) can be cured by a low-fat diet, the administration of vitamin A and diethylstilbestrol, the expression of comedones, and the use of orthodox local remedies such as lotio alba, sulfurated lime (Vleminckx's) solution, and remedies for the scalp.

2. Another assumption is that in pustular, nodular, and cystic cases the patients usually are sensitized to the

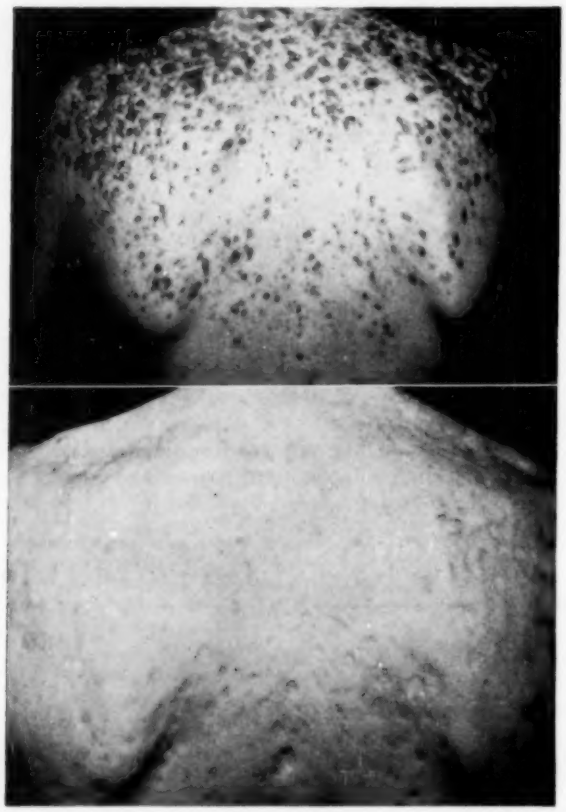

Fig. 1.—The patient, a boy aged 14, had severe, painful cystic acne of the back and the chest of one year's duration. Previous treatment had been with X rays and a low-fat diet. The patient was tired all the time and had an elevation of temperature to 100 to 101 F. each night. For two months he had had a leukocyte count of 18,000 to 22,000. Urinalysis revealed a trace of albumin and an occasional granular cast. He was treated with sulfonamides and penicillin injections with little results but cured by treatment with aureomycin, 2 gm. daily, which he took for four months, and diethylstilbestrol, 0.25 mg. daily, which he took for six months. Cultures grew hemolytic Staphylococcus aureus that was resistant to penicillin and sulfonamides but sensitive to aureomycin. Very little local treatment was given because of the extreme painfulness of the lesions.

Staphylococcus. They often harbor foci of infection which contribute to the pustulation and make it worse, if not being the sole cause. This view was expressed 20 yr. ago by one of us (G. C. A.) in the first edition of his textbook, and he was then reprimanded about this statement in the review of the book in the *Archives of Dermatology*. However, time has passed, and over and over again in these 20 yr. this concept has been borne out in practice. For example, one girl with pustular acne had pyelonephritis, and whenever the acne was bad the urine contained pus: As soon as urinary antiseptics cleared the urinary tract of infection, the acne disappeared. In another girl the acne was associated with chronic sinusitis, and the use of sulfathiazole nose drops and irrigation of the sinuses promptly cleared the acne. Several cases were promptly and spectacularly cured on the removal of impacted and infected wisdom teeth or badly infected tonsils, or after appendectomy. Sometimes we have failed to find foci of infection in pustular cases of acne, but often foci are present.

Hormone therapy in pustular, cystic, and nodular cases has regularly been prescribed and sometimes is helpful, but on the whole the chief treatment is by administration of terramycin, aureomycin, chloramphenicol (chloromycetin®), or sulfonamides and removal of focal infection.

The importance of sensitization to staphylococci in acne seems corroborated by the recent paper of Hopkins, Weld, and Huber,[2] who by intradermal injections of staphylococci into sensitized rabbits induced histopathologic changes that showed a striking resemblance to cystic acne in the humans. Large purulent cysts, small horn cysts, and comedo-like plugs in hypertrophied hair follicles were seen. There were also acanthosis and hyperkeratosis of the epidermis and downgrowth of the hair follicles.

3. We assume also that the staphylococci in pustular cases of acne differ greatly in their susceptibility to the various antibiotics. This has been repeatedly shown by testing our cultures to penicillin, sulfonamides, streptomycin, and aureomycin as well as by clinical experience. As a rule, penicillin has relatively little clinical effect and the cocci in cultures usually show resistance to it. Sulfadiazine, aureomycin, and terramycin have given us, on the whole, the best results. We have used sulfadiazine in hundreds of cases and terramycin in only about a dozen. There have been a few exceptional cases that failed to respond to any remedy except aureomycin, or sulfapyridine, or dihydrostreptomycin, or terramycin. Very careful cultural studies of such cases failed to demonstrate any Actinomycetes or organisms other than staphylococci.

The deeply nodular and the cystic types of cases were at one time thought to be largely foreign-body reactions about inspissated comedones, but the response of these cases to treatment with the antibiotics pretty well establishes that these nodular and cystic types are due to low-grade infection. Cultures usually grow staphylococci. There is sometimes leukocytosis in such cases that persists until the skin disease is cured. Take, for instance, the following unusual cases:

Case 1.—J. A., 14 yr. of age, consulted us in December, 1948, because of blackheads, tender nodules, and crusted cystic lesions on the face, back, and chest. A complete physical examination by his family physician showed only hyaline and granular casts and pus cells in the urine. Our examination showed, besides the severe cystic acne, a leukocyte count of 24,000 with 75% polymorphonuclear cells, 22% lymphocytes, and 3% eosinophils.

2. Hopkins, J. G.; Weld, J. T., and Huber, W. M.: Intradermal Injection of Staphylococci, J. Invest. Dermat., to be published.

The patient's mother was instructed to take his temperature, and it was found to be elevated each evening. The erythrocyte sedimentation rate was normal. The patient was given daily injections of penicillin, 600,000 units intramuscularly, and aureomycin capsules, 500 mg. four times daily. Sulfonamides were avoided. Improvement occurred but was slow. The urinary findings persisted, as did the leukocytosis and the evening rise of temperature. Cultures from the lesions grew only Staphylococcus aureus. When this organism was tested it was found to be resistant to penicillin and very sensitive to aureomycin. The patient was thereafter treated only with aureomycin and acne capsules, the administration of both of which was continued for eight months, although the acne was cleared and the blood count and urine had become normal within five months. He had never received much local treatment because he had refused to let anyone get near his back on account of the pain he suffered from the raw and undermined crusted cystic lesions.

CASE 2.—D. M., aged 14, consulted us in February, 1950, because of severe cystic acne of six months' duration. He had lost 17 lb. (7.7 kg.) since the onset. He was unable to sleep

Fig. 2.—The patient, aged 14, had had cystic acne for three years. She had received X-ray treatment, penicillin injections, and a low-fat diet without benefit. Cure was effected by the administration of sulfadiazine internally for four months, tonsillectomy, and the administration of diethylstilbestrol, 0.5 mg. daily. Blood count showed 12,500 leukocytes, 3,900,000 erythrocytes, and 79% hemoglobin at the beginning of treatment. In addition, the patient was given lextron® capsules (a proprietary liver-stomach concentrate with iron and vitamin B complex) and weekly intramuscular injections of estradiol benzoate (progynon® B), 2,000 to 6,000 units, for three months.

because of the very painful lesions and could not eat since movement of the jaws was extremely painful. He had avoided milk, chocolate, and fatty foods. He had received 20 X-ray treatments by another dermatologist before consulting us. Examination revealed large, crusted cystic lesions on the face, chest, and back. Many large comedones were present. Some of the cysts were blood-tinged. There was a leukocyte count of 15,500 one day and one of 19,500 a week later. Urinalysis showed a faint trace of albumin and very few granular casts. The patient was started on treatment with sulfadiazine, 2 gm., and diethylstilbestrol, 0.25 mg., daily, and the improvement was steady, but after six weeks the medication was changed to the administration of terramycin, 1 gm. daily, which cured him. The diethylstilbestrol therapy was continued. The patient refused much local treatment because of the painfulness of the lesions.

FEMALE SEX HORMONE

Female sex hormone has been administered in three ways. First, diethylstilbestrol has been prescribed in an enteric-coated tablet (Eli Lilly & Co., Indianapolis) in a single dose of 0.25 mg. daily. Rarely, the dose was

Fig. 3.—The patient, aged 16, had had pustular acne of the face and the back for two years, during which he was treated by a local dermatologist. He was cured by the administration of sulfapyridine, 2 gm. daily for three months, and diethylstilbestrol, 0.25 mg. daily for nine months. He used lotio alba locally. He had been drinking 3 qt. (2.83 l.) of milk a day; this amount was reduced to a glass a day.

changed to 0.1 or 0.5 mg. On other occasions we have prescribed gelatin acne capsules, each having the following formula:

Diethylstilbestrol	0.00025 gm.
Powdered extract of cascara sagrada	0.01600 gm.
Desiccated thyroid	0.00800 gm.
Sodium bicarbonate, as much as desired	

The patients, male or female, take one at bedtime. Rarely, girls have been given two and three daily. In some recalcitrant cases additional doses of estradiol benzoate, consisting of 2,000 and 6,000 rat units weekly, have been given parenterally.

In most instances the estrogenic hormone was given throughout the menstrual cycle. In those cases in which previously regular menses became irregular it was necessary to adjust the dose around the time of the menstrual period. This was accomplished in two ways. First, a large parenteral dose of estradiol benzoate (10,000 rat units)

Fig. 4.—The patient, aged 31, had had acne for six years and had received the limit of X-ray treatment and a low-fat diet. The condition was cured by the administration of diethylstilbestrol, 0.5 mg. daily, and sulfapyridine, 2 gm. daily for four months, supplemented by occasional injections of crude liver extract and estradiol benzoate.

was given just before the expected time of the menstrual period, or a dose of 20-25 mg. of progesterone was given in anticipation of menstruation, treatment then ceasing for a time. Apparently after a high level of either estrogen or progesterone has been built up, the ensuing precipitous

fall in hormone level accompanying the cessation of treatment with the substance brings about menstruation. The appearance of menstruation is more consistent following progesterone withdrawal. This observation bears out the statement of Grollman [3] that, physiologically, menstruation results from regression of the corpus luteum

Fig. 5.—Nodular cystic acne in the 30-yr.-old patient was of 15 years' duration. There had been X-ray treatment and dietary restriction. The condition was made worse by the administration of any form of sex hormone and was recalcitrant to sulfonamide, penicillin, and aureomycin therapy, but was cured beautifully and promptly by the administration of terramycin, 2 gm. daily for one month, followed by the use of 250 mg. daily for two months.

and a fall in progesterone level in the organism. More recently these schedules have been combined in the giving of estrogen for 16 to 18 days following menstruation, then the substitution of an oral progesterone preparation for five days, and then the withholding of all hormone therapy until menstruation occurs.

Under such a regimen the menstrual periods are usually prompt, occurring 28 to 30 days apart. Similar regulation can be obtained by the administration of es-

Fig. 6.—The patient, aged 19, had had pustular acne for six years. Previous treatment had been with X rays and diet. The tonsils had been removed. There were unerupted, impacted, infected wisdom teeth. Hemoglobin was 68%. The condition was cured by the administration of sulfadiazine, 2 gm., and diethylstilbestrol, 0.25 mg. daily, and the extraction of the third molars. The patient took sulfadiazine for three months.

trogen merely during the first two weeks following menstruation, but this method has a drawback in that with it hormone therapy is only at work half the time.

3. Grollman, A.: Essentials of Endocrinology, ed. 2, Philadelphia, J. B. Lippincott Company, 1947.
4. Wright, A. (Schering Corporation, Bloomfield, N. J.): Personal communication to the authors.

With regard to possible untoward effects of female-sex-hormone administration, we should like to quote Wright,[4] who says,

> A dose of 0.25 mg. stilbestrol daily is a minimal one and is right on the threshold of producing possible definite therapeutic effects from the endocrine standpoint.
>
> With respect to the girls, there is probably less likelihood of any possible harm than in the boys. There may be some increase in mammary development and precocious menstruation. This would be difficult to differentiate from that which would normally be taking place in the female at this age. If the therapy is long continued, there might be some interference with normal progression of adolescence.
>
> With respect to the boys, there may be some delay in puberty in a few cases caused by this minimal dose. I would watch particularly for sensitivity to stilbestrol, as evidenced by mammary development in these boys. There may be some depression of testicular function (which would account for the delay in puberty); this would be evidenced by oligospermia but clinically would be rather difficult to determine, since a normal sperm count has never been obtained in these boys.

Wright goes on to say that this form of therapy should not be continued any longer than necessary to control the acne, that total stoppages of diethylstilbestrol therapy at intervals would help prevent untoward effects, and that there is little likelihood of producing permanent definite

Fig. 7.—The patient, aged 21, had had nodular cystic acne of the face and the back for eight years. She had had 16 X-ray treatments and a low-fat diet. She had two dead teeth. Her acne was worse at menstrual periods, of regular occurrence. The condition was cured by the administration of sulfadiazine, 2 gm., and diethylstilbestrol, 0.25 mg. daily, and the extraction of abscessed teeth. The patient also received crude liver extract, 2 cc. intramuscularly, each week, and occasional injections, 2,000 units, of estradiol benzoate. She took sulfadiazine for six months.

harm from a dose of 0.25 mg. daily. This statement represents a considered opinion and is a composite view held by several outstanding pediatricians and endocrinologists.

Menstrual disturbances occurred in 65 (25%) of the 262 female patients. This was manifested by delayed menstruation, which was readily corrected by the methods previously noted. In the female patients there was one case of unilateral enlargement of the breasts, which disappeared within two weeks after cessation of therapy. In the 79 male patients there were six cases in which there occurred temporary tenderness or enlargement of the breasts, which was usually not noticed by the patient until it was brought to his attention. One patient took 0.5 mg. of diethylstilbestrol daily from June to October, 1949. His wife recently had a 9 lb. (4,082 gm.) baby boy. Some of the young men who had severe oiliness and acne, so that their appearance was repugnant, took this dose of diethylstilbestrol for two years with nothing but

apparent good effects on their growth, on their development, and on their skin. However, to be extra-cautious, we usually try to have rest intervals for the male patients, even if clinically such rest intervals seem unnecessary. In severe nodular, pustular, and cystic types of acne we have not increased the doses of estrogens but have depended largely on the administration of antibiotics. In two cases of the cystic type, any kind of hormonal therapy, even minute doses, made the patients worse. These two patients were cured by use of terramycin.

We gave 341 patients (88%) some form of estrogenic therapy. A group of 154 patients received treatment by estrogens for three months or less, 66 for four to six months, 78 for six to 12 mo. and 42 for 13 to 24 mo. Of these, there were 79 (23%) male patients and 262 (77%) female patients, a ratio of 1:3.4.

SULFONAMIDES AND ANTIBIOTICS

Patients having a very pustular eruption require, in addition to the administration of hormones, a course of sulfonamide or antibiotic therapy. It is important to prevent pustules because scars are mostly caused by pustules. Sulfadiazine is usually given in doses of 2.0 gm. daily for about two weeks, and then the dose is reduced to 1.0 or 1.5 gm. daily for eight or 10 more weeks. Although most pustular eruptions respond to this treatment, some cystic cases do better with sulfapyridine therapy. Blood counts and urinalysis are done frequently while sulfonamides are given. In a few cases of cystic acne aureomycin, terramycin, and dihydrostreptomycin have proved curative when the sulfonamides have failed. Aureomycin and terramycin were given in doses of 1 gm. daily for several months. The use of terramycin has been especially beneficial and well-tolerated. As its cost is reduced, it may become an increasingly valuable remedy in severe pustular types of acne.

It has been brought out in this series of cases that cures of many severe nodular and cystic cases of acne can be accomplished by the use of sulfadiazine, sulfapyridine, aureomycin, or terramycin without any other remedy. This fact alone suggests, first, that we must revise some of the long-held theories about acne, and, second, that infection by staphylococci is the chief cause in some cases.

FOCAL INFECTION

Frequently occurring at an age when acne appears are focal infections in impacted and unerupted wisdom teeth and in tonsils. Especially in patients 19 yr. of age or over, the wisdom teeth should be carefully X-rayed and examined. In older patients, nonvital teeth should be held under suspicion. Rarely other foci, as have been mentioned, are of importance. Many cures of long-standing acne in this series can be attributed to careful search for and removal of foci of infection. Of the 384 patients in the present series, a foci of infection was found in 45 (11%). Of these, the teeth were involved in 29 (64%), the tonsils in 13 (28%), and the sinuses in three (8%) of the cases.

SYSTEMIC MEASURES

Always a complete blood count was done and deficiencies in erythrocytes or hemoglobin were appropriately treated, or leukocytosis suggested further studies for foci of infection or treatment by antibiotics.

The chief features of the diet recommended are the avoidance of excessive amounts of fatty and fried foods and sweets and the eating of plenty of fruit, cereal, meat, and vegetables. Chocolate, nuts, ice cream, cream, egg yolk, and cheese should be avoided. Milk should be limited to a glass or two a day. Diet plays a negligible role in pustular and cystic cases. Where the patient is underweight, has poor posture, pallor, and listlessness, injections of crude-liver extract or vitamin B_{12} are given. These are also useful if there is much seborrheic dermatitis concomitant with the acne. Hypochromic anemia is treated by administration of ferrous sulfate. Arsenic in the form of potassium arsenite (Fowler's) solution was sometimes prescribed. Basal metabolic rates and serum cholesterol levels were determined for many patients, and thyroid extract was given whenever indicated. Staphylococcus ambotoxoid injections were occasionally given in a series of 10 or more injections. In the presence of many comedones, vitamin A is given. The dose ranges from 100,000 to 200,000 units a day, and this dose must be continued for three to six months before its effectiveness may be judged. In addition, aqueous dispersions of vitamin A may be given once or twice weekly parenterally in severe cases of comedones. Such large doses may be continued for months without harm, but prudence suggests that reductions in the dose should be made after a year.

Emotional factors are extremely important in acne. The psychosomatic relationship is unquestionably present, and after the emotional conflicts and problems are rationalized the acne subsides. Observation of the close relation of acne to puberty and sex hormones and the effects of these forces upon the emotions clarifies to an extent the psychosomatic features of acne. We have thought that we noted improvement of the psyche along with improvement of the skin. Perhaps some severe cases of acne are caused by overactivity of the androgens, which overactivity at the same time produces perplexing problems and emotional conflicts for the boy or girl. At any rate, there is no doubt that as the acne subsides from the use of diethylstilbestrol and other remedies the patient becomes happier, more contented and less detached from society.

LOCAL TREATMENT

Local treatment is of great importance. Supplementary cleansing of the skin with alcohol in addition to the use of soap and water morning, noon, and night will decrease the number of comedones and the amount of infection. As a more-or-less routine procedure, we prescribe the application of hot sulfurated lime solution compresses twice weekly and lotio alba or some other sulfur preparation, sometimes containing resorcinol, at bedtime. Occasionally a suspension of ammoniated mercury (alulotion,* ammoniated mercury with kaolin, Wyeth, a lotion containing ammoniated mercury, 5%, with kaolin and aluminum hydroxide gel) is used. The application of topical preparations of tyrothricin, bacitracin, and aureomycin is sometimes beneficial. Comedones are extracted and pustules are drained at weekly office visits. Patients are weighed every three weeks. Instructions are given for the patient to wash the face with soap and water at least twice a day and to avoid creams and greasy preparations. Nongreasy cosmetics are permitted but must be applied with clean cotton because reinfection may occur

from dirty powder puffs. When peeling of scars is desired, ultraviolet or cold quartz light irradiation or applications of carbon dioxide slush are given, or scarification is done with a No. 11 Bard-Parker knife.

Concomitant seborrhea of the scalp is treated with appropriate local remedies.

CONTROL SERIES

As a control, 1,287 records of cases of acne treated by X rays prior to 1948 were reviewed, and selection was made of 253 of these records which met the following criteria:

1. All patients had been treated with X rays in a period before our newer methods were instituted and had not received estrogenic hormone, chemotherapeutic, or antibiotic therapy. Cases were not included if the patients had received X-ray treatment elsewhere, and a therapeutic total dose must have been given under our supervision. No patient in this series received less than 600 r to the sides of the face, and none received more than 1,400 r to the sides of the face. In some instances, smaller doses were given to the chin or midface in addition to treatment to the sides of the face, a technic no longer used. The average total dose to the sides of the face was 1,050 r. These doses would not now be considered conservative.

2. Each case must have been followed for at least one year after treatment was begun, but in most instances the follow-up period was longer than one year and, in many cases, over five years. The average period of observation for the 253 patients was 35.8 mo., almost three years.

In this control series there were 73 male patients (29%) and 180 female patients (69%), for a ratio of 1:2.46. The average age was 20.17 yr.; the mean was 19.

The results show that 152 patients (60%) were entirely cleared up or improved; 51 patients (20%) were not appreciably better or worse, and another 50 patients (20%) cleared up for a time and then had recurrences. No consistent cause for the recurrences, such as age, sex, or amount of X-ray treatment given, can be discovered in our results. In retrospect, it seems probable that many failures and recurrences were caused by foci of infection in the teeth or tonsils which were given less consideration then than at present or by a continuation of a hormone imbalance in spite of diminished oil-gland secretion brought about by X-ray treatment.

These results are similar to those reported previously by other observers, and discrepancies can probably be accounted for by the mode of selection and the length of the follow-up period.

While it is true that some patients were cured during the first few months of treatment and their cases are not included in the results because they were not observed for a year, these cases are probably balanced off by an almost equal number in which the patients had recurrences during the first year but did not return for further treatment.

RESULTS OF TREATMENT IN PRESENT SERIES

Any critical appraisal of newer methods depended upon discontinuation of routine X-ray treatment. Moreover, an ideal control situation presented itself in those cases in which the safe limits of X-ray therapy had been administered previously. Of the 384 patients in this series, 175 (46%) had received previous X-ray treatment, mostly from other dermatologists.

The final results of treatment in the present series of 384 patients are as follows: 90 patients (23%) were cured; 276 (71%) were improved, and 18 (6%) were unimproved or worse. In other words, 94% were either entirely cleared up or improved. The time of observation has been too short for the number of recurrences to be estimated.

It can be readily seen that these results are superior to those obtained in the control series treated with X rays but without antibiotics and estrogens.

COMMENTS

Statistics in such matters are open to so much personal influence and to so many errors in judgment that probably not too much dependence should be placed on these. However, we who have done this work can assure you that the results have pleased us to a degree beyond expectation. It would be regrettable if estrogenic-hormone therapy were widely used as the sole treatment of acne. A few years ago the view was widely held that acne should be treated solely by X rays without even the expression of any comedones. Both of these views show complete ignorance. Acne is a complicated disease with important medical as well as cutaneous features. Many internal, as well as local, procedures of treatment must be carefully employed in order for one to treat acne efficiently. X-ray treatment in small doses has a permanent place in the treatment of acne. Our experiment is over, and we may use X-ray therapy again occasionally. However, the overwhelming success we have had with modern remedies has dulled our desire to use X rays and has whetted our interest in the modern therapeutic approach to acne.

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ABSTRACT OF DISCUSSION

DR. MERLIN T. MAYNARD, San Jose, Calif.: In 1933 I largely abandoned the use of X rays in the treatment of acne, and now, 17 yr. later, I have no regrets. Acne responds to certain influences, all of which in a measure tend to do the same thing—that is, influence the amount of ionized calcium in the skin. They are the use of estrogenic hormone substances, calcium injections, the injection of anterior-pituitary substance, ultraviolet irradiation, X-ray treatment, the giving of calciferol or irradiated ergosterol in the presence of a source of calcium. Conversely, acne flares in the premenstrual phase in women when the calcium blood level falls. It gets worse in fevers and wasting illness, when calcium is, likewise, lost. It begins in adolescence, when the demands for calcium by the growing body are greatest. My approach for many years has been through calciferol as a mainstay of treatment. Successful acne treatment swings on a common hinge. Calciferol, synthetic oleovitamin D, and the estrogenic hormones are all steroids. I approve the use of estrogenic hormones in young girls but am inclined to withhold judgment on their use for boys on the ground that the production of feminizing changes, when such boys are most sensitive to their masculinity, is psychologically dangerous. I also question the advisability of delaying puberty. Diet is moderately important, and I agree with the authors, permitting more milk than they do. I insist that gum chewing must be avoided because of the stimulation of the circumoral sebaceous glands and because of the continued movement of the inflamed areas. For local treatment I prefer soluthricin® solution (a solubilized form of tyrothricin, 0.5 mg. per cubic centimeter) in the superficial pustular cases and a solution of the intraderm® type for the usual run of the comedo and deeper forms of the disease. Vitamin A has been disappointing, as I cannot improve on the results in my original series, in which only 50% of my patients showed improvement with the use of this substance. I do not incise pustules, as I find

this procedure increases scarring. I prefer to aspirate large lesions with a syringe and needle instead. There is no substitute for the "clinical sense" of the skilful and experienced practitioner in whose hands a treatment is successful that does not prove to be so in the hands of his fellows. We see the failures and not the cures and unfortunately weigh the value of a new regimen of case management on the basis of what is often the minor factor. I feel that all of us will attack the acne problem with new vigor after hearing this stimulating paper.

DR. WILLIAM H. GOECKERMAN, Los Angeles: The authors have made a great contribution to the management of some of these severe cases of acne. The cases presented here probably had a secondary pyogenic infection; the multiple attack is sufficient evidence of that. I wondered whether the authors had any evidence as to what part the estrogens played in the results they obtained. I have been interested in hormone therapy of acne as long as I can remember. My investigative work with estrogens has been restricted to the female. Today I unhesitatingly give the patient with acne a good prognosis, no matter what treatment has been given. I am talking about the patients I have investigated, not so much the type presented here. If my experience can be a guide, in about 30 to 40% of the cases one can obtain a good response by giving the ordinary doses of various types of estrogen. I have used possibly a half-dozen different types while trying to evaluate them. But there comes a time when the acne may grow somewhat worse or makes no progress toward cure, and that is the time when considerable critical judgment must be used. Shall the dose be increased? With perseverance and cooperation of the patients I have had good results in 90 to 95% of my cases. Why is it that certain dosages will produce a good response in some cases and then the benefit will stop, with no further result unless there is modification of approach? There is much clinical and experimental work to support a certain concept with regard to the therapeutic administration of hormones. All hormones probably have an indirect effect, and I think that statement is true of pituitary adrenocorticotropic hormone and cortisone, as well as the estrogens. They work on certain target organs. One can easily overstimulate, as well as understimulate, these target organs. I think hormone therapy is a potent agent in our hands. It can easily be abused. One can, in a certain percentage of situations, give the standard dose as it is usually given, but he cannot say, "This is the dose indicated," because one has strictly to individualize his patients; from this interest in the individual patient one will get excellent results.

DR. GEORGE KULCHAR, San Francisco: My only point in rising to speak is to ask questions. Has there been any effect through the use of estrogens in alcoholic solution on the treatment of acne, both on the scalp (acne miliaria type) and on the skin (acne vulgaris)? I have used this preparation and have been impressed with the results, particularly with acne miliaria on the scalp in seborrheic persons. The British are ahead of us to a certain extent in the treatment of seborrheic dermatitis, which is a part of acne, particularly in their use of the estrogens in the treatment of premenopausal women, women 38 and 40, with seborrheic dermatitis, which in this age group is quite refractory to treatment. I wish to ask Dr. Andrews regarding the use of combinations of Staphylococcus antitoxin and vaccine or autogenous vaccines and Staphylococcus vaccines as an adjunct in the treatment of acne.

DR. GEORGE C. ANDREWS, New York: Of course, the estrogenic hormone increases calcium metabolism, and that fact may be one of the reasons its use is so effective in acne. In regard to Dr. Goeckerman's question, we have used estrogenic hormones in practically all these cases, but we find that, in the nodular cases—and in the pustular cases—we need something in addition to estrogenic hormones. Hormones are not usually sufficient in themselves. They do a great deal of good usually, but, in addition, one has to get after the pustular element, get rid of any focal infection, or treat the skin with antibiotics. We have used estrogens locally but not in alcoholic solution. We used them in ointments, mostly, following the suggestions in a Portuguese article published about a year ago which reported excellent results from the local use of estrogenic ointments. We have not obtained the results the Portuguese workers did. The result, if any, from this treatment is obtained very slowly. We have used vaccines, but the treatment I have described is so clean-cut, so definite, and so short that vaccines are not required; if treatment including the use of terramycin and these other things is followed out, they really are not needed. If there is a focus of infection, it is better to get rid of it than to treat it with vaccine. In most of these cases, the skin is sensitized either by the infection of the skin itself or by some focus to the Staphylococcus.

TREATMENT OF PSORIASIS WITH UNDECYLENIC ACID BY MOUTH

Herbert Rattner, M.D., Chicago
and
Harold Rodin, M.D., South Bend, Ind.

The clinical course of psoriasis has been recognized and described since the time of Celsus, but the cause of the disease still remains unknown. Psoriasis has been attributed to faulty metabolism of both proteins and fats, to parasitic and bacterial infections, to neurogenic disorders, to vitamin deficiency, and to dysfunction of the endocrine glands. A relationship with the arthritides has long been suspected. All these factors seemingly are unrelated, and treatments directed against them have given variable results. There has been no one drug or individual method of treatment that will cure psoriasis or even afford control of the disease in all cases with any degree of certainty. Because of the frequency with which the disease is encountered and the large problem that it presents, the announcement of a new remedy for psoriasis always arouses interest, and so Perlman's [1] first report on the peroral use of undecylenic acid for the treatment of psoriasis attracted considerable attention. This interest was acute, not only because of the favorable results that he reported but also because the treatment was altogether new, with no basis whatever from previous studies with the drug to suggest a rationale for its use in psoriasis. In fact, the drug was first used perorally by Perlman not for psoriasis but for ringworm of the scalp, a treatment that was suggested by the work of Rothman which explained the rarity of tinea capitis after the onset of puberty. Rothman [2] and his associates had demonstrated that "with the onset of puberty the sebaceous glands of the scalp start to secrete a sebum which contains in higher concentration than before, low boiling saturated fatty acids (of the nature of undecylenic acid) with selective fungistatic and fungicidal action on M. audouini." The treatment with undecylenic acid, incidentally, failed to cure the ringworm of the scalp, but

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This paper is the second in a "Symposium on Therapy," read before the Section on Dermatology and Syphilology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

1. Perlman, H. H.: Undecylenic Acid Given Orally in Psoriasis and Neurodermatitis, J. A. M. A. **139**: 444-449 (Feb. 12) 1949.

2. Rothman, S.; Smiljanic, A., and Weitkamp, S. W.: Spontaneous Cure of Tinea Capitis in Puberty, J. Invest. Dermat. **8**: 81-98 (Feb.) 1947.

during the course of treatment it was noted that there was a profuse desquamation of the children's scalps, and it was this observation apparently which suggested the use of undecylenic acid for psoriasis.

In February, 1949, Perlman's first report was published. This was a study of a small series of 17 patients with chronic psoriasis who were observed for only a short period. Although he emphasized the preliminary character of the report, there was no mistaking Perlman's enthusiasm over the results that were obtained, and this same note of satisfaction ran through his two subsequent reports.[3] In the last of these he reported on his experience with a group of 100 cases as follows: good results in two-thirds of the cases, great improvement in associated arthropathy, and decided relief of itching in 51%. The reactions that he observed, although frequent, were considered to be bothersome rather than serious. "Concurrent topical therapy affected improvement more quickly but the end results were no better than when undecylenic acid was used alone."

The reports were not without interest and significance, and, as we are always alert for "something new for psoriasis," we undertook to use this method, adopting the same dosages that were recommended by Perlman. It soon became evident that our therapeutic results were in no way comparable with those that he had reported. We found that in our group of 40 cases only one showed any improvement. Then, too, we encountered not only a high incidence of gastrointestinal side-effects but also reactions of a more serious nature. There were three cases in which there was almost immediate exacerbation and spread of the disease. In two of the patients the spread continued unhampered to the development of exfoliative dermatitis, and one of these patients became so severely ill as to require hospitalization for treatment with pituitary adrenocorticotropic hormone. We learned through informal discussions with various members of the Chicago Dermatological Society that they also had failed to duplicate Perlman's results and that they, too, were encountering reactions.

The treatment in the meantime had been mentioned in several health columns in newspapers. General practitioners and persons afflicted with psoriasis began to make inquiries. It seemed important, therefore, for fear of prejudging the method, for us to enlarge our sphere of investigation, and questionnaires were then sent to dermatologists in all parts of the country asking specifically for information regarding the number and types of cases treated, the results, the reactions encountered, and considered opinions of the treatment. The men whose aid was enlisted are all experienced dermatologists acquainted with the vagaries of psoriasis. Most of them are qualified teachers of dermatology, and all of them are men of position in the specialty who are known to have serious judgment and not to be given to answering such questions lightly.

It is of interest to note that nine of the 75 dermatologists in this group had not used the treatment because it lacked a rationale. Forty-two of them reported on its use in 1,106 cases. Each case was observed for a period of at least three months, and each physician reported on from 20 to as many as 130 cases. In fairness to the treatment, it was decided to discard answers to the questionnaire that recorded results in fewer than 15 cases, doses smaller than those originally recommended, or a treatment period of less than 10 weeks. It was learned subsequently that these need not have been discarded because the results recorded for this group were similar in essential details to those for the entire group.

Side effects were recorded by nearly every observer. In general these were unimportant gastrointestinal disturbances—either nausea, vomiting, belching, a fishy taste in the mouth, fullness, diarrhea, or "heartburn." They were common symptoms and not unexpected, since undecylenic acid is related to castor oil. It is an 11-carbon, straight-chain unsaturated fatty acid, $CH_2CH(CH_2)_8COOH$, produced by splitting from the ricinoleic acid of castor oil by pyrolysis.[4] It has an objectionable fatty odor and an acrid taste. The symptoms produced by it were unpleasant and bothersome, but in most cases they could be controlled by lowering of the dose of the drug, by the discontinuation of treatment for a while, by a change to enteric-coated capsules, or by the administration of sodium bicarbonate, peppermint, or carbonated beverages. There were recorded also one instance each of headache, conjunctivitis, axillary adenitis, folliculitis, and acneform eruption. There were three cases of urticaria.

Not all of the side effects, however, could be considered inconsequential. In one instance a quiescent peptic ulcer was activated into serious hemorrhage, and in another there was exacerbation of a case of gout which had been quiescent. Recorded also were one case of auricular fibrillation and one of coronary pain, both of which disappeared when the use of the drug was discontinued and recurred when it was administered again. There were 11 cases recorded in which the psoriasis began to spread, not in the manner of a Herxheimer reaction but rather in that of a true exacerbation of the disease, the spread continuing in seven cases to the development of exfoliative dermatitis. The latter must always be considered a dangerous disease, involving as it does the reticuloendothelial system. These reactions, although serious, were nevertheless low in incidence, and their rare occurrence would ordinarily not hamper the use of the drug if the therapeutic results from it warranted its use.

Unfortunately, most of the observers found their results disappointing. Despite an occasional favorable response to the treatment, eight men recorded their

3. Perlman, H. H., and Milberg, I. L.: Peroral Administration of Undecylenic Acid in Psoriasis, J. A. M. A. **140**: 865-868 (July 9) 1949. Greenbaum, S. S., and Perlman, H. H.: Further Observations with the Peroral Administration of Undecylenic Acid in the Treatment of Psoriasis, read before Section on Dermatology, Pennsylvania State Medical Society, Pittsburgh, Sept. 27, 1949.

4. Ereaux, L. P., and Craig, G. E.: The Oral Administration of Undecylenic Acid in the Treatment of Psoriasis, Canad. M. A. J. **61**: 361-364, 1949.

results as inconclusive, and four, although their results proved disappointing, felt the method should have a longer period of trial. The overwhelming opinion, however, from 38 of the physicians, was strongly critical of the treatment. They expressed their judgments in terms such as "absolutely worthless," "dangerous as well as worthless," "totally unimpressed," "decidedly ineffective," "very disappointing," "no longer use it," and "cannot recommend it." These comments are cited only because they are so emphatic. New drugs, new methods of treatment, or new interpretations of disease usually are met with some reservations, and differences of opinion are often freely expressed, but seldom are opinions stated with such vehemence as were those which have been cited. The significance of this fact is obvious.

At the meeting of the American Academy of Dermatology and Syphilology in December, 1949, these results were discussed before the section on pharmaceutical therapeutics and before the popular "Stump the Experts" panel, which was attended by some 500 members. The fact that more than half of the queries submitted to the panel dealt with the treatment of psoriasis with undecylenic acid gives some indication of the widespread interest in it. When Dr. Perlman rose to refute the results recorded on the questionnaires, his spirited defense of his treatment was received rather unsympathetically by the audience. But, of greater importance, he received open support from only one other physician, whose experience, as he himself pointed out, was limited to but eight cases. A few others "were not yet willing to condemn the treatment." In sharp contrast, the general tone of the comments heard at these sessions and informally through the several days of the meeting was unmistakably in agreement with those reported in the questionnaires, both in substance and in emphasis of expression. One observer told of a case of labyrinthitis [5] that resulted from the use of udecylenic acid; there were several reports of drug eruptions, reports of two instances of nephritis, and mention of quite a few additional cases wherein exacerbation occurred, sometimes to the development of exfoliative dermatitis.

COMMENT

Psoriasis is an erratic disease. Its course is not always one of relentless progression. It is capable of spontaneous exacerbations and remissions, and such remissions may last for years. It is often subject to seasonal variations and sometimes to emotional influences. It is a common observation that in some persons psoriasis will respond to almost any form of therapy and recurrences in the same patients may later resist the same therapy. It has been observed, too, that results from treatment often are directly proportional to the enthusiasm with which the treatment is administered. It would seem, then, that before any therapy can be evaluated for a disease such as psoriasis it must necessarily be tried on many types of cases and for a long period—years may be necessary for proper evaluation of a new treatment. It is easy to err in the direction of undue optimism. Perhaps one may err also in discrediting a treatment too readily. In this instance we think we have not, for we have made it a practice from time to time up to the past few weeks to inquire of our colleagues about their subsequent results from the treatment. Like us, not one has had reason to temper his original unfavorable opinion of it.

Unless experience with pituitary adrenocorticotropic hormone [6] and cortisone—which is only beginning—should prove to be successful, there is still no one method of treatment that will cure the disease or even afford certain control in all cases of psoriasis.

SUMMARY AND CONCLUSIONS

This report on the use of undecylenic acid by mouth for the treatment of psoriasis is based on the experience derived from its use in more than 1,100 cases. Eighty-five of these were treated by us; the others, by some 75 dermatologists from all sections of the country, who, in reply to a questionnaire, recorded results, reactions, and impressions following use of this treatment method. Because the clinical course of psoriasis is so unpredictable and erratic, and because the treatment with undecylenic acid is so new—the first report having appeared less than two years ago—only a status report can be made at this time.

A review of the answers to our questionnaire revealed that side effects occurred frequently. Most of them were unimportant gastrointestinal "upsets," but not a few cases were encountered in which there was a flare-up and spread of the psoriasis even to the development of exfoliative dermatitis. There were several isolated instances of other side reactions, too. Only a few of the physicians regarded their results as at all favorable, while several others were undecided and preferred to defer expression of a final opinion for a time. On the whole, however, the overwhelming opinion was decidedly unfavorable, some of the physicians recording their impressions in terms such as "worthless," "ineffectual," and "disappointing."

104 S. Michigan Ave., Chicago (Dr. Rattner).

5. Hand, E. A., and Wilkinson, C. F., Jr.: Toxic Labyrinthitis Following Oral Undecylenic Acid Treatment of Psoriasis: Report of a Case, J. Invest. Dermat. **14**: 227-228 (April) 1950.

6. Hench, P. S.; Kendall, E. C.; Slocumb, C. H., and Polley, H. F.: Effects of Cortisone Acetate and Pituitary ACTH on Rheumatoid Arthritis, Rheumatic Fever and Certain Other Conditions: Study in Clinical Physiology, Arch. Int. Med. **85**: 545-666 (April) 1950.

General Practitioners and Scientific Exhibits.—The Scientific Exhibit at the meetings of the American Medical Association is administered by a committee of about 30 persons, headed by the Committee on Scientific Exhibit of the Board of Trustees. Each of the sections of the Scientific Assembly elects a representative to the Scientific Exhibit to assist and advise, in addition, there is a general advisory committee. Under such auspices, the best in medicine is shown at American Medical Association sessions, with leading physicians participating. One of the visiting British physicians attending the recent Atlantic City meeting said he was amazed to see how cheerfully the leaders in various branches of medicine make themselves available to the small-town practitioner. Nowhere else in the world is such consultation and advice possible.

BROMIDE INTOXICATION TREATED WITH AMMONIUM CHLORIDE

Theodore Cornbleet, M.D., Chicago

Many physicians believe bromides have fallen into disuse and newer drugs have completely replaced them. This is far from the truth—people take large amounts of these "old-fashioned" remedies continually. Authorities tell us bromides should be discarded, but physicians still prescribe them, and the public obtains them freely and easily in proprietaries and by name "over the counter." The habit that many develop of feeding at the "bromide bottle" can lead to evil effects that all should be aware of. The drug accumulates in the body sometimes to dangerous levels and then, on occasion, disaster results. The reason for dire effects is twofold: Many people keep taking a bromide without a let-up, and it is excreted slowly.

Bromides need not be taken for a very long time, however, or in large doses for evil effects to occur; a few persons seem more easily injured by this drug, and

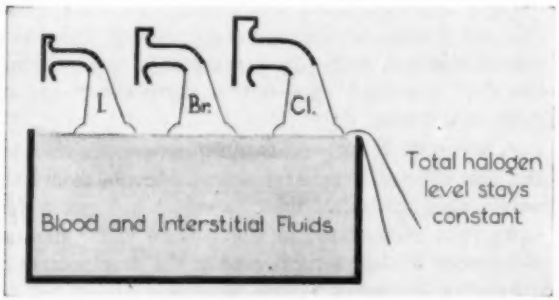

Fig. 1.—The proportion of spill-over through the kidneys of any one halide to the others is the same as that in the total mass of blood, tissue, and tissue fluids. The total of chloride is so much greater than that of the other halides that at any one time bromide constitutes a relatively small proportion of the total halide washed out through the kidneys. It takes a long time until all the halides present in the body at any time are finally excreted and replaced.

some call this facility "allergy." Large-enough accumulations, however, will harm anyone. People with bromide intoxication may show mental symptoms and at times need to be sent to institutions. Our patients, however, all had cutaneous eruptions, which can be of diverse forms and mimic the rashes of many other diseases. It is common knowledge that bromide eruptions are not uncommonly misdiagnosed. Most of us do not realize to what extent people take drugs (certainly bromides), and even if we should think of asking a patient about them, we accept his denial too easily. Dermatologists appreciate how difficult it is to wheedle a reliable drug history even from patients who are honest and eager to cooperate. After unearthing the fact that the patient's troubles are due to the bromides he has been taking, it is important—at times, lifesaving—for one to know how to displace them quickly.

To do this, we ought to know how the halides behave in the body. This will help us administer these drugs with better effect and less dangerously, too. The body makes little distinction in the handling of either bromide or chloride—it absorbs one as well as the other and distributes them in about the same manner. Their relative concentrations in the interstitial fluids depend on how much of each was ingested or injected and how much was there beforehand. The halides remain for the most part extracellular. Appreciable amounts are in the red cells, although little penetrates other cells. Just as with absorption and distribution, the body shows little distinction in the way it excretes bromides or

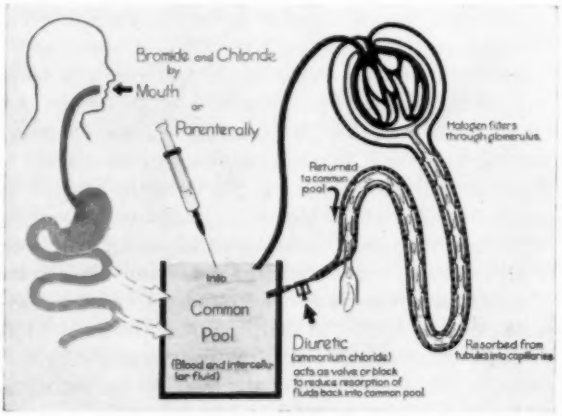
Bromide and Chloride by Mouth or Parenterally
Halogen filters through glomerulus
Returned to common pool
Into Common Pool
(Blood and intercellular fluid)
Diuretic (ammonium chloride) acts as valve or block to reduce resorption of fluids back into common pool
Resorbed from tubules into capillaries

Fig. 2.—Chloride displaces bromide from the blood and tissues. Halides are filtered through the glomeruli but partly reabsorbed through the tubules. Acid diuretic chlorides prevent a part of the reabsorption back into the blood, thus sending more bromide out through the urine and hastening its depletion in the body.

chlorides. From a physical point of view, one halide will take the place of another.

Sollmann [1] says that bromide excretion takes place mostly through the urine but that some bromide gets into the feces. There is a small amount in milk and sweat, and some is present in the exfoliating epidermis. The rate at which bromide is excreted depends on its concentration in the fluids, the amount of other halide taken up to replace it, and the ability of the kidneys. O. Bodansky and Modell [2] found that mersalyl (salyrgan®) and theophylline step up the excretion of bromide and chloride. My associates and I found this, too, provided that the administration of a halide accompanied the giving of the diuretic. When there is no further uptake of bromide, less is excreted—at first, very little less. Later it clings to the body more and more, so that traces of it may remain afterward in the urine for as long as a month and even longer.

Chloride hastens the excretion of bromide by a sort of exchange process. That is why the ingestion of foods that contain little chloride retards the excretion of

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Read in a "Symposium on Therapy" before the Section on Dermatology and Syphilology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

1. Sollmann, T.: A Manual of Pharmacology, ed. 7, Philadelphia, W. B. Saunders Company, 1948.

2. Bodansky, O., and Modell, W.: Excretion and Storage of Bromide Ion, Am. J. Physiol. **133**: 216, 1941.

bromide. Wagner and Bunbury [3] say that they found higher levels of bromide in the blood when they gave large doses of sodium chloride. They believe that the reason for this observation is that chlorides mobilize bromide from the tissues faster than the kidneys can excrete the latter halide. We did not find this to be so.

The knowledge that chloride will displace bromide from the body led to the use of sodium chloride for this purpose. The administration of sodium chloride by mouth and injection is today the standard treatment for bromide intoxication. It seemed to us that there might be some advantage in having a diuretic accompany the use of chloride for this purpose. Increased formation of urine could perhaps carry off more displaced bromide. One could use the popular mercurial diuretics, but doing so would add another remedy to the primary one (sodium chloride). Besides, there is some risk in using them. The acid diuretic chlorides, such as ammonium chloride, on the other hand, not only provide chloride but are diuretics at the same time. Moreover, they are relatively safe.

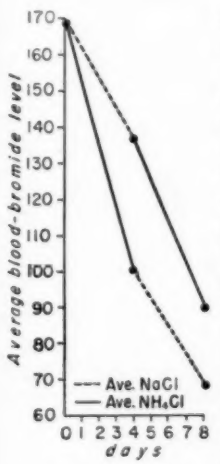

Fig. 3.—Average blood-bromide levels of patients with bromide eruptions who were treated with ammonium chloride and with sodium chloride.

In this study we compared the effects of these diuretic chlorides with those of sodium chloride (the standard for treating bromide intoxication) in a group of patients with bromide eruptions and volunteers who took bromides, to see whether the diuretic agents offered any advantage. We divided the patients into two groups: One received ammonium chloride for the first four days (6 gm. daily in enteric-coated tablets). At the end of four days we determined the blood-bromide levels and then started the second four days' tests. The group that began with ammonium chloride then received sodium chloride, while the one that started with sodium chloride changed to ammonium chloride. The doses remained the same during the second four days' trials, and at the end of this period we again determined the blood-bromide levels. In this way we continued to reverse each patient's and volunteer's treatment every four days until most of the bromide in each was gone. We believe that by arranging the experiments in this way we were able to make fair comparisons as to the relative efficacy of the diuretic chlorides and sodium chloride for removing bromide from the body (Table 1). There were five patients in the first experiment—four with acneform lesions, and the fifth with granlomas on the legs.

METHOD

The method of estimating the blood-bromide levels was the Taylor modification of Wuth's method as described by Todd and Sanford.[4]

Reagents.—Reagents used were as follows: (*a*) a 10% solution of trichloroacetic acid; (*b*) a 0.5% solution of gold chloride in distilled water, and (c) standard solution, prepared by the dissolving of 100 mg. of sodium bromide in 20 cc. of distilled water and then the addition of a 10% solution of trichloroacetic acid (*a*) to make 100 cc. One cubic centimeter of this standard solution is the equivalent of 1 mg. of bromide.

Technic.—The following technic was used: 1. Five cubic centimeters of blood was withdrawn by venipuncture and placed in a tube containing ammonium oxalate.

TABLE 1.—*Blood-Bromide Levels (Milligrams) in Subjects with Bromodermas Given Sodium Chloride or Ammonium Chloride in Alternating Periods*

Subjects	Initial Value	4 Days	8 Days	12 Days	16 Days	20 Days
A	184	N 142	A 90	N 61	A 27	.. ..
B	135	A 77	N 50	.. ..	.. ..	.. ..
C	68	N 52	A 29	.. ..	.. ..	.. ..
D	256	N 213	A 150	N 114	A 65	N 46
E	200	A 122*	N 88	A 51	.. ..	.. ..

* The asterisk indicates a five-day interval; *N*, the administration of sodium chloride, 6 gm. daily, in enteric-coated tablets, and *A*, the administration of ammonium chloride, 6 gm. daily, in enteric-coated tablets.

Subject D had granulomatous lesions over the lower legs; the other four had acneform lesions.

2. Two or 3 cc. of oxalated blood was diluted with four times its volume of a 10% solution of trichloroacetic acid (*a*).

3. The mixture was centrifuged and filtered.

4. To 5 cc. of the filtrate, 1 cc. of a 0.5% solution of gold chloride (*b*) was added in a test tube.

5. Two cubic centimeters of the standard solution (*c*) was placed in a tube and trichloroacetic acid added to make 5 cc. Then 1 cc. of a 0.5% solution of gold chloride was added. Solutions were compared in a colorimeter with the standard set at 20.

Calculation.—The following was the calculation used:

$$\frac{20}{\text{reading of unknown}} \times 2 \times 100 = \text{mg. of bromide per 100 cc.}$$

RESULTS

The results of these tests on patients with bromide eruptions seemed to show that their blood-bromide level fell more rapidly when we treated them with ammonium chloride and more slowly with sodium chloride therapy (Figs. 3 and 4).

We made the second study on a group of seven volunteers. Each took 3 gm. of sodium bromide daily for seven days, and then we determined their blood-bromide levels. After this part of the study the seven subjects were divided into two groups—one of three and the other of four. We alternated their treatment

TABLE 2.—*Blood-Bromide Levels (Mg.) in Volunteers Given Three Grams of Sodium Bromide Daily for One Week Followed by the Administration of Sodium Chloride or Ammonium Chloride in Alternating Periods*

Subjects	Initial Value	4 Days	8 Days	12 Days
A	133	N 88	A 37	.. ..
B	75	A 35	N 22	.. ..
C	114	N 90	A 57	N 44
D	67	A 31	N 25	.. ..
E	86	N 70	A 42	.. ..
F	121	A 84	N 68	A 39
G	93	N 64	A 27	.. ..

A indicates the administration of ammonium chloride, 6 gm. daily, in enteric-coated tablets, and *N*, the administration of sodium chloride, 6 gm. daily, in enteric-coated tablets.

3. Wagner, C. P., and Bunbury, D. E.: Bromide Intoxication, J. A. M. A. 95:1725 (Dec. 6) 1930.

4. Todd, J. C., and Sanford, A. H.: Clinical Diagnosis by Laboratory Methods, ed. 11, Philadelphia, W. B. Saunders Company, 1948.

every four days, using diuretic chlorides and sodium chloride in turns, just as we did with the patients with bromide eruptions (Table 2). The results of this study again seemed to show that the blood-bromide levels fell more rapidly with ammonium chloride and less rapidly with sodium chloride (Figs. 5 and 6).

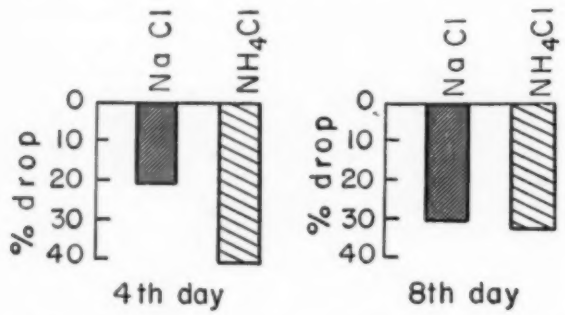

Fig. 4.—Percentages of drop in blood-bromide level observed on the fourth day and on the eighth day of treatment in patients with bromide eruptions treated with ammonium chloride and with sodium chloride.

One volunteer took 3 gm. of sodium bromide daily for two weeks and then received two injections of mersalyl a week apart. As with all the other patients and volunteers, we determined his blood-bromide levels every four days. The mercurial diuretic by itself seemed not to clear the blood of bromide any faster than did ordinary diets in three other volunteers (Tables 3 and 4). Evidently the diuretic needs chloride with it to hasten bromide excretion.

One volunteer took 3 gm. of sodium bromide daily for two weeks. When he finished with this, he drank fruit juice daily containing 60 gm. of urea. The administration of urea did not hasten the loss of bromide from his blood (Table 5). (We used urea because the liver forms it from ammonium, and this observation in itself could conceivably account for the action of ammonium chloride in our studies.) Perhaps we should have used the urea together with a chloride for a more adequate test.

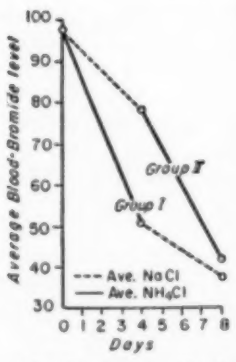

Fig. 5.—Average blood-bromide levels of volunteers treated with ammonium chloride and with sodium chloride.

COMMENTS

The whole purpose of the treatment of bromide intoxication is to hasten the removal of the halide. There are two main steps in doing this: The first is the displacement of the bromide from its combinations, and the second, its excretion. The total level of all the halides together in the blood and intercellular spaces remains at about a fixed level. The injecting or ingestion of chloride forces as much stored, combined halide into the urine. Water lost in dehydrating the body (sweat and urine) carries with it, too, these multiple halides. Obviously, this method alone has its limitations and is, otherwise, objectionable.

Diuretic chlorides have a dual action in removing bromides. They furnish chloride for displacing the bromide and at the same time are diuretics. We believe ammonium chloride is the most advantageous one to use. It is simple, cheap, and fairly safe. It should not be used when the kidneys are damaged. The enteric-coated tablets are not irritating to the stomach, and most people can take a total of 5 to 8 gm. a day in divided doses without distress.

There are several ways to explain the action of the diuretic chlorides in increasing urine formation. According to a modern theory, chloride filters through the kidney glomeruli, but more than 99% of this filtrate is reabsorbed back into the system by way of the kidney tubules. When ammonium chloride, for example, is given as the diuretic, the liver converts the

TABLE 3.—*Blood-Bromide Levels Observed in Volunteer Given Three Grams of Sodium Bromide Daily for Two Weeks Followed by Administration of Mersalyl Twice, with an Interval of a Week*

Days from Start	Blood-Bromide Level, Mg.
15	173*
19	149
23	128*
27	105

* The asterisk indicates administration of mersalyl.

TABLE 4.—*Blood-Bromide Levels in Volunteers on Ordinary Diet, After Treatment with Three Grams of Sodium Bromide Daily for Two Weeks*

Days from start		15	19	23	27
Blood-bromide level, mg.	A	214	179	148	121
	B	186	...	128	107
	C	230	182	150	...

TABLE 5.—*Blood-Bromide Levels Observed in Volunteer Given Sodium Bromide, Three Grams Daily for Two Weeks, Followed by the Administration of 60 Grams of Urea in Fruit Juice Daily*

Days from Start	Blood-Bromide Level, Mg.
15	204
19	167
23	140
27	111
31	82

ammonium into urea. There remains then an excess of chloride, and this the tubules refuse to reabsorb from the urinary filtrate. There is a limit to the amount of strong acid the kidneys can excrete, and so some of the chloride is neutralized by sodium or a fixed base. Compensatory factors acting through the posterior lobe of the pituitary body and the adrenal cortex cause an equivalent amount of water to leave with the sodium.

The body can detoxify many drugs by conjugation or other process. In bromide intoxication, however, the offender must be excreted. This fact explains, too, why the untoward actions of this halide may persist. Since more than 99% of the halide filtering through the glomeruli gets back to the blood, the bromide must make many trips to the kidneys before all of it ultimately stays in the urine. This bromide and its larger ratio of chloride together require a long time for removal by this piecemeal excretion process. Another factor that probably acts to retard the loss of bromide

is the presence of some of the substance within the red cells. This amount is not filtered directly. As the plasma-bromide level falls, some of the halide in the erythrocytes leaves and is taken up by the fluid pool and is then subject to kidney filtration. This observation probably accounts for an appreciable time lag.

Some kinds of lesions naturally heal more quickly than others. The small acne-like lesions from bromide clear away quickly after the patient stops taking his medicine. The large, fungating granulomas on the legs, however, take much longer to resolve. But, then, most granulomas are torpid, and lesions on the legs take longer to heal than their counterparts elsewhere.

SUMMARY

We made clinical and experimental observations on patients with bromide eruptions and volunteers. The therapeutic abilities of the acid diuretic chlorides (ammonium chloride) and sodium chloride for displacing blood bromide were compared. We found that bromide is excreted and lesions heal faster with ammonium chloride than with sodium chloride treatment. The theory of chloride action in combating bromide intoxication is briefly outlined and discussed.

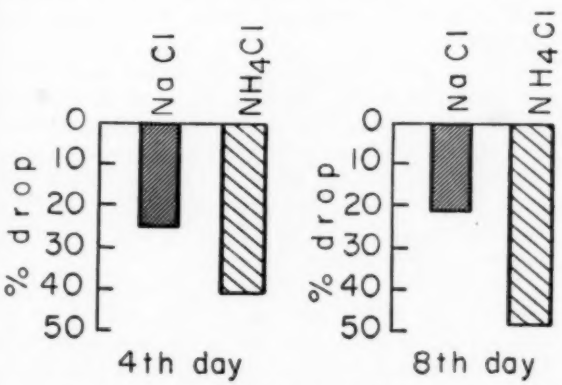

Fig. 6.—Percentages of drop in blood-bromide level observed on the fourth day and on the eighth day of treatment in volunteers treated with ammonium chloride and with sodium chloride.

30 N. Michigan Blvd.

ABSTRACT OF DISCUSSION

DR. C. P. BONDURANT, Oklahoma City: I should like to congratulate Dr. Cornbleet on his fine study of bromide retention. My interest in this subject has been of long standing, and I realize that this type of investigation requires much detailed attention. Since my work on the use of the cortical hormone with reference to bromide excretion, I have seen an increasing number of cases of bromide intoxication. Dr. Cornbleet's point as to who takes bromides is well put. This drug is more widely used than we suppose. Laymen, druggists, and many physicians are still not alert to the dangers of this so-called mild sedative. The warnings and legislation which exist against the barbiturates have driven many to the use of the unrestricted bromides, and when we review the list of commonly used remedies which contain bromides, we are not surprised at the number of bromide-retention cases which are seen. We need legislation regulating the sale of bromides the same as has been enacted for barbiturates. If we can do nothing other than to put that point over to the public in this paper, our efforts will be well spent. It is generally accepted that a blood-bromide level of 150 mg. is necessary for the production of psychotic symptoms, but this high a level is not needed for the dermatological lesions. I am sure all of us have seen flare-ups in these cases with continued use of bromides. The statement that the body must be rid of all its bromide is fundamental in this type of therapy. I cannot quite go along with Dr. Cornbleet on the idea that a blood-bromide level of 22 to 30 mg. is all right. In handling this type of therapy, we must rid the body of its bromides if we are to rid it of its symptoms. A study of the spinal fluid is most interesting. The chemical exchanges in the spinal fluid are slow in comparison with those in the blood and other tissues and account for the prolonged time necessary for recovery in intoxication cases. We might say that the spinal fluid acts as a reservoir and, as its bromides are unloaded into the system, an exacerbation of the condition in the spinal fluid may be caused. One of my colleagues, who is a professor of pharmacology, determined the bromide level on some spinal fluid taken at autopsy and found it to be 400 mg., which observation shows that bromides not only are intoxicating but can produce fatal outcome in these cases. We try to include a spinal-fluid examination in all cases of bromide intoxication, and here I might suggest, as a further treatment of bromide intoxication, and particularly the cases with psychotic symptoms, that repeated spinal drainage is a good procedure. Repeated spinal drainage should have a place in the treatment of all bromide-intoxication cases that have gone to a state where they include any type of mental disturbance. Dr. Cornbleet has shown that the use of a diuretic chloride is superior to the old sodium-chloride method used alone, and he is to be commended on this observation. The addition to this therapy of cortex-hormone will aid these patients considerably. I believe that more work is necessary to determine the proper range of dosage of ammonium chloride in these cases. The use of this type of replacement therapy is not without some dangers. Since many bromide-takers are abnormal otherwise, complete blood-chemistry and kidney-function investigations are necessary. This work establishes clearly the superior therapeutic effect of ammonium chloride over the mercurial diuretics, the latter endangering the chloride reserve. Nature's own diuretic, water, should be used freely, but with due regard to kidney function. Much valuable data could be gained if we extended this study and not only recorded the blood-bromide level but also examined each specimen for sodium, potassium, and chloride content as well.

DR. THEODORE CORNBLEET, Chicago: Harris and Derian have called attention to the fact that chronic bromide intoxication presents a syndrome similar to that of pellagra. They gave their patients nicotinamide and obtained gratifying results. They recommend that this vitamin factor be given alone in cases of cardiac decompensation when sodium chloride is contraindicated. Ammonium chloride, too, might be useful in such cases, I believe. Cortisone and other cortical steroids influence sodium and potassium chloride (and, of course, bromide) retention and excretion. They will provide, no doubt, another means to combat bromide intoxications. I think, however, for the present, that the use of ammonium chloride provides us with a simple method for quickly removing bromides from the body.

Writing Medical Papers.—Sir William Osler, although his short intelligible papers in simple English do not show the signs of effort, often rewrote his papers six or eight times in longhand before they were typed for the first time. Sir Clifford Allbutt thought it reasonable to go over a paper about nine times. Tolstoy said, "I cannot understand how anyone can write without rewriting everything over and over again." . . . Dr. William H. Welch told his classes that almost all of the great discoveries in medicine were reported in articles of less than 3,000 words. . . . However, accuracy and clarity should not be sacrified in an attempt to achieve brevity. You owe your reader a complete explanation.—Miley B. Wesson, Writing a Medical Paper: Why and How, *Journal of Urology*, April, 1951.

ASPHYXIA NEONATORUM

NEW METHOD OF RESUSCITATION

Allan Bloxsom, M.D., Houston, Tex.

The purpose of this study is (*a*) to examine critically the present methods of resuscitation of the asphyxiated newborn infant and (*b*) to present the results of a new method of resuscitation using positive pressures in an oxygen air lock for oxygenation and the expansion of gases to expel pulmonary fluids and secretions.

The material for this study consisted of 100 asphyxiated newborn infants delivered by members of the obstetrical staff of St. Joseph's Maternity Hospital during the period Jan. 4 to May 4, 1950. During this period there were 1,786 deliveries, which gives an incidence of one in every 18 newborn infants requiring resuscitation. In every 100 deliveries approximately six infants were sufficiently asphyxiated to require special resuscitative measures.

Behind the physiological curtain of a considerable degree of cyanosis,[1] consisting of an average mean capillary unsaturation of more than 6.5 vol. % of oxygen in which the fetus exists in utero normally before birth, exists a mechanism that at the start of labor places the fetus under pressure, increases at intervals the oxygenation of the fetal blood,[2] maintains adequate heat and moisture, and provides stimuli to initiate respirations.[3]

The purpose of labor is believed to be twofold. That which is most obvious is the birth of the infant. The hidden purpose is found in the prelabor contractions and resulting pressures leading to respiratory efforts.[4] Pressures generated at labor serve as an important part in the conditioning of the fetus [3] to start his respirations promptly. The final mechanical squeezing of the infant's chest by the birth canal when the head has been delivered, which obstetricians have observed on many occasions, serves in the immediate expulsion of fluids from the pulmonary tree as a concluding step in the preparation for respiration.

The mechanism of this conditioning of the fetus by the mother is believed to be (*a*) a washing in and out of amniotic fluid by a minute tidal wave in an effort to prevent atelectasis at birth by a predelivery expansion of the alveoli in fluid and (*b*) a variation in the pressure gradients of oxygen and carbon dioxide to condition and stimulate the respiratory center. The above chain of events opens the short second act in the newborn infant's life during labor and should be considered the initiation of his "operation oxygenation."

Asphyxia neonatorum results when the events and forces operative to introduce oxygen into the fetus and newborn infant are lacking, or a physiological barrier is produced causing anoxia. Anoxia may be classified generally as anoxic, anemic, stagnant, or histotoxic. Specifically, a few of the clinical conditions resulting in asphyxia neonatorum are narcotization, effects of certain types of anesthetic, prolonged periods of anesthesia, prolonged periods of anoxia resulting from the premature separation of the placenta, prolapsed cord, cord about the infant's neck, lack of labor pressures in cesarean section, and certain toxemias of pregnancy disturbing the pressure gradients of oxygen and carbon dioxide between the mother and the fetus. Eastman [5] found that in the severely asphyxiated infant the oxygen content of the umbilical vein averaged 1.3 vol. % and the carbon dioxide tension 61.6 mm. of mercury.

The immediate problem of relieving the asphyxia neonatorum and resuscitating the handicapped infant resolves itself, therefore, into one of not only getting the respiratory center to function properly in the presence of a severely disturbed blood concentration of oxygen and carbon dioxide, but preventing a damaging anoxia of the cells of the central nervous system until adequate external respiration will provide sufficient oxygenation of the blood for adequate internal respiration.

After a study on the difficulty of beginning respiration seen in a series of cesarean section infants,[3] the thought occurred that the varying positive intrauterine pressures had an essential and important part in oxygenation and preparation of an infant to initiate quickly his respiration, both external and internal after a normal delivery. It seemed reasonable that if a means could be constructed to enable the newborn infant having difficulty in beginning oxygenation and adequate respirations to assume once more the pressure conditions existing in utero during labor and, at the same time, be supplied heat, moisture, and oxygen and exposed to slow, gentle chest respiratory exercises, similar to those he received in utero from changes in pressure, there might be a more favorable outcome, with regard to not only the infant's immediate existence but the future development of his central nervous system. Accordingly, a positive-pressure oxygen air lock [6] was constructed (Fig.) to contain the asphyxiated infant, furnish him with heat, moisture, increased oxygen concentrations for peripheral absorption, and pressures, together with a cycling of those pressures simi-

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The positive-pressure oxygen air lock was manufactured by the Loewenstern Corporation, Houston, Tex.

The members of the Obstetrical Service and Sister Carmen of St. Joseph's Maternity Hospital helped to make this study possible.

Read before the Section on Pediatrics at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 29, 1950.

From the Department of Pediatrics, the St. Joseph's Children's Hospital, and the Department of Pediatrics, Baylor University College of Medicine.

1. Eastman, N. J.: Foetal Blood Studies: I. The Oxygen Relationships of Umbilical Cord Blood at Birth, Bull. Johns Hopkins Hosp. **47**: 221, 1930.

2. Windle, W. F.: Physiology of the Fetus: Origin and Extent of Function in Prenatal Life, Philadelphia, W. B. Saunders Company, 1940, p. 75.

3. Bloxsom, A.: The Difficulty in Beginning Respirations Seen in Infants Delivered by Cesarean Section, J. Pediat. **20**: 215, 1942.

4. Ahlfeld, F.: Die intrauterine Tätigkeit der Thorax- und Zwerchfellmuskulatur, intrauterine Atmung, Monatsschr. Geburtsh. u. Gynaek. **21**: 143, 1905.

5. Eastman, N. J.: Foetal Blood Studies: III. The Chemical Nature of Asphyxia Neonatorum and Its Bearing on Certain Practical Problems, Bull. Johns Hopkins Hosp. **50**: 39, 1932.

6. Bloxsom, A.: Resuscitation of the Newborn Infant: Use of the Positive Pressure Oxygen-Air Lock, J. Pediat. **37**: 311, 1950.

lar as far as possible to those he might receive during the second stage of labor. Table 1 shows the advantages that might be expected from positive-pressure oxygen air resuscitation of the asphyxiated newborn infant.

The first 100 asphyxiated newborn infants oxygenated and resuscitated in an oxygen air lock were in a

TABLE 1.—*Advantages of Positive-Pressure Air Resuscitation of the Asphyxiated Newborn Infant*

1. Promotes bronchial drainage by the expansion of gases for the expression of fluids and secretions in the pulmonary tree
2. Provides a more uniform alveolar aeration
3. Increases absorption of oxygen through the skin and upper respiratory passages
4. Relieves and protects against atelectasis
5. Provides gentle breathing exercise and improves muscle tone
6. Combats acute pulmonary edema
7. Provides favorable conditions for the diffusion and use of oxygen by the premature infant
8. Disposes of handling of infant on part of the physician or nurse

TABLE 2.—*Resuscitation of One Hundred Asphyxiated Newborn Infants Among 1,786 Deliveries*

	Number		Alive		Dead	
Weight at Birth, Gm.	M	F	M	F	M	F
400 to 1,000	6	6	0	1	6	5
1,001 to 2,500	23	17	15	15	8	2
2,501 and above	28	20	25	20	3	0
Total	57	43	40	36	17	7

group of 1,786 deliveries at the St. Joseph's maternity Hospital in Houston, Tex., from Jan. 4 to May 4, 1950. The immediate results of treatment in these 100 asphyxiated newborn infants are shown in Table 2.

During the four-month period this study was carried out, a total of 34 newborn infants died in this hospital. Ten of the newborn infants who died were not placed in the air lock, either because there was not a lock available or because the physician in charge did not order this method of resuscitation. At first the lock was used

TABLE 3.—*Mortality Rates for January, February, March, and April, 1949 and 1950*

	1949	1950
Number of infants delivered	2,000	1,786
Stillbirths	39	25
Deaths (other than stillbirths)	50	34
Death rate (excluding stillbirths)	2.5%	1.9%
Change in death rate	Decrease 25%	

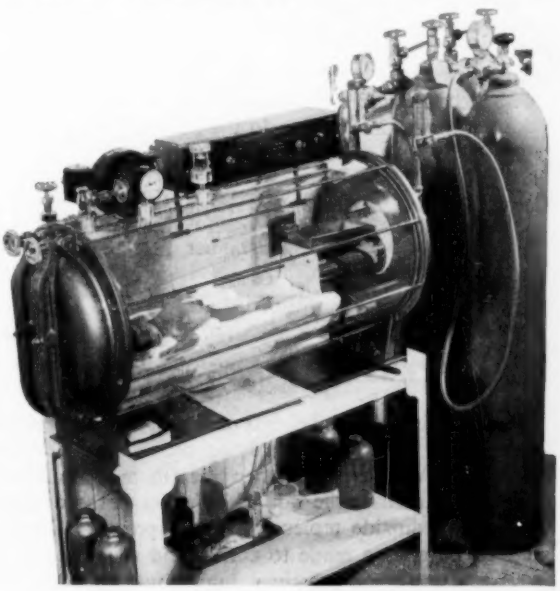
TABLE 4.—*Time Required in Air Lock*

	Time, Hr.															
	1		2		4		8		12		24		48		Above	
Weight at Birth, Gm.	L.*	D.*	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.
400 to 2,500	2	2	5	4	5	4	4	1	0	2	6	6	4	0	5	0
2,501 and above	15	1	15	0	7	0	6	0	4	1	0	1	0	0	0	0

* *L.* indicates living and *D.* dead.

in a number of cases as a measure of last resort; the infants were deeply cyanotic many minutes past the time of delivery, and the irreversible changes described by Schmidt [7] had occurred in numerous instances. One of the infants was to all purposes dead, and no heart beat could be elicited when it was placed in the lock. Heart beats and respiration, of course, could not be established.

The mortality rates of the first four months of 1949, when the air lock was not used, and the first four months of 1950, when it was in use for the obstetricians who desired it in the St. Joseph's Maternity Hospital, are given in Table 3. The associated decrease of 25% in the death rate of the living newborn infants since the oxygen air lock was first used has to be examined for other possible favorable factors operative to reduce the death rate in any hospital. One major factor is the decrease in the number of premature infants delivered. During the first four months of 1950 the incidence of premature deliveries dropped to 5.15 from 5.95% in 1949. This decrease would account for some of the favorable decrease in the infant mortality rate, provided the premature birth weights were in both years comparable. However, the incidence of very small premature infants delivered weighing 1,000 gm. or less increased about 50% in



Positive-pressure air lock.

1950 as compared with 1949. A very high percentage, about 85%, of the premature infants weighing 1,000 gm. or under die. The reduction in premature delivery rate that favorably influences the infant mortality rate has been neutralized to some extent or done away with by the great increase in deliveries of premature infants weighing 1,000 gm. or less. It is believed, therefore, that there has been an actual decrease in the death rate of the newborn infants in this hospital associated with the use of the positive-pressure oxygen air lock.

Table 4 shows the time required by the 100 asphyxiated newborn infants in the air lock. It is interesting to note that all premature infants living more than 24 hr. survived. The great majority of deaths of premature infants occurred 2 to 4 hr. after delivery. The majority of the full term infants died 12 to 24 hr. after delivery. Once a premature infant reached the 24-hr. mark he

7. Schmidt, C. F.: Influence of Cerebral Blood-Flow on Respiration: Respiratory Responses to Changes in Cerebral Blood-Flow, Am. J. Physiol. 84: 202, 1928.

required four to 10 days to establish adequate oxygenation and respirations. One edematous infant was left in the lock for 80 hr. before administration of fluids was considered advisable. Several premature infants were left in the lock 48 hr. until the skin appeared nonedematous.

COMMENT

Henderson [8] states:

> The first quarter of an hour after birth is the most dangerous period of life. Its mortality is as great as that of any subsequent month. No single discovery in medical science or improvement in practice could do more to save lives than would measures to avoid the losses that now occur within a few minutes after birth.

Eastman [5] insists that "there seems to be only one urgent indication in the treatment of asphyxia neonatorum, and that is to introduce oxygen into the circulating blood of the infant." In addition, it seems to me that a number of the asphyxiated infants are in considerable shock, cold and listless, with all the tissues of the body in poor tone. The correction or prevention of further increase in shock, the increase of the infant's blood pressure, and the increase in tissue turgor, are all quite necessary, in addition to the introduction of oxygen into the asphyxiated newborn infant.

TABLE 5.—*Results of Use of Expansion of Gases to Remove Pulmonary Fluids and Secretions in One Hundred Asphyxiated Infants*

	Living		Dead	
Weight, Gm.	M	F	M	F
400 to 2,500	4	7	3	1
2,501 and above	6	2	0	0
Total	10	9	3	1

The relieving of the anorexia of the asphyxiated infant can be considered the infant's "operation oxygenation" and appears to take place easier when there is a positive pressure to increase the rate of diffusion of the oxygen and carbon dioxide molecules. These pressures in the air lock have been made to correspond roughly to the relative intrauterine pressures found by Salerno.[9] The lack of a variation of these positive intrauterine pressures in infants delivered by cesarean section has resulted in an increase in difficulty in beginning respiration of approximately 25%.[3] Prelabor contractions were observed by Windle [2] to be accompanied with an improvement in the color of the umbilical vein. The frequent slowing down of the fetal heart beat at the height of labor contractions in the early part of the labor probably indicates a hyperoxygenation of the fetus. The subsequent increase of rate with the relaxation of the uterine contraction means once more a state of relative anoxia. Toward the end of labor, when the pressures are such that the uterine arteries and veins are embarrassed, the above conditions are probably reversed.

With the condition of shock in which these infants often appear to be, it seems logical that the stagnation of the blood in their lungs makes it more difficult to absorb oxygen and give up carbon dioxide. It may well be that a number of asphyxiated infants who were thought to have atelectasis are in a considerable degree of shock, with an impairment of their pulmonary circulation, and can use oxygen only under difficulty. Eastman [5] states that the oxygen content of the umbilical vein blood at birth may occasionally fall to 5 vol. % without the infant showing clinical evidence of asphyxia. In his series of severely asphyxiated infants [5] the oxygen of the umbilical vein blood varied from 0 to 2.9 vol. %. The active transport of oxygen by the air lock under a physiological pressure and with the removal of carbon dioxide offers a safe means of resuscitation involving no exhausting physical effort on the part of the resuscitating physician to supply oxygen and no crippling activity on the infant's part to use that oxygen. Eastman [5] warns against using physical stimulation when the infant is cyanotic and, as stated previously, insists that the essential treatment of asphyxia neonatorum is the introduction of oxygen into the circulating blood of the infant.

It is believed that the asphyxiated newborn infant can absorb considerably more than 10% of his oxygen requirements through his skin. It is known that this amount [10] can be absorbed by diffusion through the skin of the adult unclothed and surrounded by an atmosphere of 100% oxygen. The initial relief of cyanosis seen in many infants when they are placed in the lock under increased pressure suggests that a considerable amount of oxygen is absorbed through the skin and upper respiratory passages.

It has been thought that many of these asphyxiated infants could not breathe because of the presence of a tracheal or bronchial plug of mucus or fluid, and that the use of a tracheal catheter or the bronchoscopic examination, with the subsequent removal of the plug and the carrying of oxygen down the trachea, would be of value.[11] Potter [12] states, however, that

> The presence of excessive amounts of amniotic fluid within the lungs at the time of birth is of little consequence and does not interfere with the entrance of air. The rich capillary bed of the alveolar walls absorbs fluid rapidly, and air probably enters as easily as if excessive amounts of fluid had not been inspired.

This has been my experience in the resuscitation of asphyxiated infants with the air lock.

House and Owens,[13] on bronchoscopy of 23 infants, were able to find in only one case a plug of exudate in a single bronchus. A progressive improvement in the infant's respiration, with complete relief taking place most frequently from 6 to 8 hr. after instrumentation, occurred in the authors' series of asphyxiated infants.[13] Prompt relief does not occur at once, which clearly shows that it is theoretically and practically impossible to remove enough pulmonary fluids for immediate relief of the asphyxiated newborn infant by means of a tracheal tube, whether a bronchoscope or a tracheal catheter.

8. Henderson, Y.: The Prevention and Treatment of Asphyxia in the Newborn, J. A. M. A. **90**: 583 (Feb. 25) 1928.
9. Salerno, J. P.: Observation on Intrauterine Pressure During First Stage of Labor, Am. J. Obst. & Gynec. **36**: 294, 1938.
10. Doak, E.: Personal communication to the author.
11. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice: A Text in Applied Physiology, ed. 5, Baltimore, Williams & Wilkins Company, 1950, p. 358.
12. Potter, E. L., and Adair, F. L.: Fetal and Neonatal Death: A Survey of the Incidence, Etiology and Anatomic Manifestations of the Conditions Producing Death of the Fetus in Utero and the Infant in the Early Days of Life, ed. 2, Chicago, University of Chicago Press, 1949, p. 18.
13. House, H. P., and Owens, H.: Atelectasis of the Newborn: Treatment by Bronchoscopic Drainage, J. Pediat. **28**: 207, 1946.

Removal of pulmonary fluids must be accomplished by the infant or through expansion of gases to express fluids and secretions.

This means of expelling pulmonary fluids by the expansion of gases is the best theoretical and practical method available at present. Table 5 shows the results of the use of expansion of gases to expel fluids and secretions in this series of 100 asphyxiated infants. A total of 23 infants in the series expelled pulmonary fluids. The quantity of these fluids varied from a few cubic centimeters to very large amounts. For the most part, the fluids were clear and frothy, but in a few instances they appeared to be mucopurulent. Two infants expelled blood-tinged mucus, one of whom had been initially resuscitated with the use of a tracheal catheter and as a last resort placed in the air lock. After an initial period of benefit, the respirations became greatly embarrassed and he was removed from the air lock. It was found that this infant had a pneumothorax, and at autopsy three puncture wounds were observed in the lower lobe of the right lung.

Brief postmortem studies on 10 of the 24 infants processed in the air lock are given below.

Baby J., a boy of 30 weeks' gestation, weighed 3 lb. 12 oz. (1,701 gm.) after breech delivery with double footling presentation. He lived 24 hr. Autopsy diagnoses were slight subdural hemorrhage, slight subarachnoid hemorrhage, hyaline membrane in lung, and bilateral atelectasis.

Baby R., a boy of 34 weeks' gestation, weighed 4 lb. 9 oz. (2,070 gm.) after breech delivery. He lived 23 hr. 45 min. Autopsy diagnoses were subdural and intraventricular hemorrhage, bilateral tear of tentorium cerebelli, edema of the brain, partial atelectasis of lung, and petechial hemorrhages into the heart.

Baby E., a boy of 30 weeks' gestation, weighed 4 lb. 15 oz. (2,240 gm.) after low forceps delivery. He lived three days after removal from the air lock and died of erythroblastosis fetalis, kernicterus, and partial atelectasis.

Baby S., a boy of 38½ weeks' gestation, weighing 6 lb. 10 oz. (3,005 gm.), was delivered spontaneously. He lived 12 hr. Anatomic diagnoses were erythroblastosis fetalis and atelectasis of lungs.

Baby K., a boy of 34 weeks' gestation, weighed 3 lb. 15 oz. (1,786 gm.) after breech delivery. He lived 4 hr. 15 min. Diagnoses at autopsy were tear of tentorium cerebelli, subdural hemorrhage, and atelectasis of lungs.

Baby C., a boy of 40 weeks' gestation, weighed 8 lb. 12 oz. (3,969 gm.) after breech delivery. He lived 22 hr. Autopsy diagnoses were hemorrhage into the right side of the chest, fracture of left clavicle, tear of tentorium cerebelli, subdural hemorrhage, and bullous emphysema.

Baby M., a boy of 38 weeks' gestation, weighing 5 lb. 6 oz. (2,438 gm.), lived 5 hr. 30 min. after midforceps delivery. Diagnoses on autopsy were tear of tentorium cerebelli, subdural hemorrhage, right pneumothorax, right parenchymal hemorrhage, and multiple focal areas of atelectasis on both sides. The right lung showed three minute rents near the anterior lateral margin of the lower lobe.

Baby B., a girl of 36 weeks' gestation, weighing 4 lb. 10 oz. (2,098 gm.), was delivered by cesarean section because of placenta previa. She lived 6 hr. The autopsy diagnoses were bilateral atelectasis and multiple subpericardial hemorrhages.

Baby M., a boy of 28 weeks' gestation, weighed 2 lb. 4 oz. (1,021 gm.). There was prolapse of the cord, with a double footling breech delivery. The diagnosis on autopsy was internal hydrocephalus.

Baby D., a boy of 23 weeks' gestation, weighing 1 lb. 15 oz. (878.8 gm.), was delivered spontaneously. He lived 2 hr. 14 min. The autopsy diagnosis was atelectasis.

In the above group of 10 infants studied at autopsy, five had tentorial tears, in four instances associated with a breech delivery. Two infants had severe erythroblastosis fetalis, and one a congenital malformation of the brain. No bronchial secretions or tracheal plugs were seen in any of these autopsied infants.

Table 6 shows the results from use of the tracheal catheter.

In the group of 24 infants in this series subjected to tracheal catheterization, expansion of gases in the air lock removed fluids in only four. In the group of 23 infants from whom fluids were removed by the expansion of gases, the tracheal catheter was used but four times. This suggests that it is impossible for the resuscitating physician to determine to any degree of accuracy which infant the tracheal catheter theoretically might benefit. Even with using it in the correct infant, the physician may not be able to remove much of the pulmonary fluids and secretions. The risk of trauma is so great that tracheal catheterization is associated with a considerably increased mortality, and an occasional puncture of lung

TABLE 6.—*Use and Nonuse of Tracheal Catheter for Oxygenation and Removal of Pulmonary Fluids in Premature Infants*

	Tracheal Catheter Used in Resuscitation		Nonuse of Tracheal Catheter	
Weight, Gm.	Living	Dead	Living	Dead
1,500 to 2,500	4	3	24	6
Per cent	57	43	80	20

or stomach occurs. It is hoped that the use of this instrument, even in intelligent hands, be discontinued in view of the above findings.

The increased hydration with edema, seen so frequently in the newborn premature infant, makes its appearance quite early in many of the premature infants placed in the air lock. It is thought that the premature infant easily shifts his vascular fluids to the extracellular spaces because of his low blood-serum proteins, particularly albumin. This accounts for the excess hydration at birth and later loss of weight during the first few days of life. The atelectatic and immature lung of the premature infant probably absorbs more pulmonary fluid in proportion than the mature lung of the full term infant.

The amount of tissue hydration occasionally seen in the premature infant placed in the air lock does not seem to be more than that produced by labor contractions in the premature infant spontaneously starting his respirations and not requiring the air lock. This increased hydration may be of considerable physiological value to the premature infant in the first few days of life, in that administration of fluids does not have to be started immediately. This gives the premature infant a chance to become accustomed to extrauterine life without a great deal of handling and manipulation.

A few infants have been observed to show an unusually prompt physiological jaundice. This is believed to be caused by an early and adequate oxygenation, leading to a quick destruction of the excess blood in the newborn infant.

SUMMARY

A preliminary report is made on a series of 100 asphyxiated newborn infants, occurring in a group of 1,786 deliveries, resuscitated by a positive-pressure oxygen air lock.

The initial absorption of oxygen through the skin and upper respiratory tract is most important. Increasing the pressure of oxygen available for this method of absorption is a vital step in resuscitation.

The expansion of gases expels fluids and secretions from the upper respiratory tract and lungs in approximately one of four asphyxiated newborn infants. The expansion of gases to expel fluids and secretions from the upper respiratory tract and lungs makes unnecessary the use of tracheal suction with its attendant trauma. The use of the tracheal catheter should be discontinued because of an abnormally high associated mortality.

Positive-pressure resuscitation subjects the asphyxiated infant to no physical stimulation on the part of the physician or nurse.

The positive pressure employed by the mother in labor and used in this study subjects the asphyxiated infant to no danger and has been continued for periods as long as 10 days for the premature infant.

The mortality rate in a large maternity hospital has been lowered with the associated lowering of the incidence of premature deliveries and the use of the positive pressure oxygen air lock in the resuscitation of the asphyxiated newborn infant.

ABSTRACT OF DISCUSSION

DR. ARTHUR H. PARMALEE, Beverly Hills, Calif.: I believe the premises on which Dr. Bloxsom's method is based need to be reviewed in order to evaluate it properly. Discussion of the mechanisms involved in the initiation of respiration in such texts as Windle's "Physiology of the Fetus," Smith's "Physiology of the Newborn," or Barcroft's "Researches on Prenatal Life," reveals the uncertain state of knowledge about what actually goes on in the initiation of postnatal pulmonary respiration. Smith aptly stated the case in these words: "Until we know why most babies breathe when they emerge from the uterus we shall scarcely be sure why some babies do not." Oxygen is the fundamental need of the asphyxiated newborn. Dr. Bloxsom's method accomplishes at least two things that are advantageous to the infant: First, it favors absorption of oxygen through the skin and the mucous membrane of the upper respiratory tract, sufficient perhaps to tide the baby over until such time as respirations may spontaneously begin. Second, it certainly locks the infant up, safe from meddlesome and unintelligent treatment. I am a little frightened by mechanical devices. They are so impersonal, and there such great temptation to place too much reliance on them. Their use tends to exclude personal responsibility for and individual evaluation of the patient in question. It would seem, in my opinion, more important that physicians and nurses be trained to understand something of the physiological processes in fetal and neonatal life, so that they can have an intelligent approach to the problems involved in asphyxia neonatorum and the kind of treatment indicated in individual cases.

DR. ROBERT A. JOHNSTON, Houston, Tex.: Admitting that the first few hours and the first day of life are the most perilous for the newborn, one understands the great interest the obstetrician has in any immediate resuscitative measure, as well as any continued supportive aid for the infant during this hazardous period. It is my opinion that the lock resuscitator, in exerting its positive pressure, fulfils such requirements for the newborn infant. The older methods of resuscitation employed by members of the profession not only have been of questionable success but most likely should be considered harmful. The insertion of a gauzed finger into the mouth and throat to wipe out mucus, thus injuring the mucous membranes; the grasping of the tongue with an Allis clamp and the periodic tugging on same; the uncontrollable pressure of mouth-to-mouth breathing; the frequent immersion of a shocked infant from a warm to a cold tub of water; the stretching of the sphincter ani muscle by inserting an oversized finger into the rectum; the intermittent jackknifing of the infant as well as the forceful compression of the chest of the distressed infant by the hand of a well-meaning attendant; even the spectacular tossing of the infant into the air, as advocated by Schultze—all these measures, judged by present-day knowledge, seem not only questionable but definitely unjustifiable. Any infant withstanding such treatment deserves to survive, although it may have "cauliflower" ears and healed multiple fractures to exhibit to posterity. Looking back over a private obstetrical practice of about thirty years, I am forced to question whether one is justified in doing more than draining the respiratory passages of the infant by gravity, preventing the loss of heat whenever possible, and occasionaly exerting nontraumatizing external sensory stimulation. The careful employment of the infant bronchoscope, especially in cases in which there is the "tapioca" type of amniotic fluid or evidence of an obstructed bronchus, needs no comment. The administration of drugs as a respiratory stimulant is of merit in some cases. With the use of the lock resuscitator, one can dispense, in practically all cases, with the tracheal catheter and its attending danger. To reduce infant mortality, a triple responsibility is shared by the anesthetist, the obstetrician, and the pediatrician. The cooperation of such a team, along with a well-regulated premature nursery, inevitably leads to a reduction in infant mortality. The lock resuscitator invented by Dr. Bloxsom is a boon to the obstetrician, the anesthetist, and the pediatrician. I have witnessed its efficacy repeatedly. The infant can be constantly observed, and at the same time it is protected from being handled or injured by well-meaning but overzealous accoucheurs. The temperature and the amount of oxygen, as well as the humidity, are automatically controlled for the optimum benefit to the infant. Correctly timed intermittent forced pressure takes the place of sensory stimulation. It is astounding to see the amount of fluid that the infant may express from the respiratory tract. I have witnessed its marvelous achievement of resuscitating several infants and its keeping these babies alive thereafter. The change for the worse in some of the premature infants removed only for a short interval from the resuscitator was so marked that no doubt was left concerning its lifesaving value. The resuscitator will perform the impossible. The newborn still needs the alertness, care, and keen judgment of the triumvirate mentioned. I believe statistics in the future will confirm that the lock resuscitator offers the most ideal place for the newborn infant, especially if distressed, to spend the most perilous period of its life.

DR. ALLAN P. BLOXSOM, Houston, Tex.: The question has been asked whether the fluid comes from the pulmonary tree or from the stomach. The reasons that suggest its coming from the pulmonary tree are (1) that the fluid is frothy, as a rule, and in the form of small bubbles and (2) that the fluid is expelled, for the most part, when the pressure in the lock is being decreased. If the fluid were coming from the stomach, one would expect it to be smooth and to appear when the pressure in the lock is being increased.

Toxemias of Pregnancy.—Two main types of hypertensive pregnancy toxemia are seen. The preeclampsia-eclampsia complex has received considerable attention, but the more permanent arteriosclerotic toxemia very little. Vital statistics indicate that the latter is more important as a cause of maternal death than the former, since there is, even in the absence of further pregnancies, a 20 per cent ten-year mortality and in their presence a 40 per cent rate. It has been estimated that about 40 per cent of the toxemias of pregnancy are of this type.—F. E. Whitacre, M.D., Obstetrics and Gynecology, in Medicine of the Year: Philadelphia, J. B. Lippincott Company, 1951, p. 83.

CLINICAL NOTES

ALKALOSIS DUE TO HYPERVENTILATION

A REPORT OF THREE CASES

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Gilbert H. Marquardt, M.D.
and
George M. Cummins Jr., Chicago

Recently one of us (G. H. M.) reviewed the factors involved in the regulation of acid-base balance and pointed out the necessity of actual determination of the blood pH for correct differentiation of respiratory and metabolic acidosis and alkalosis.[1]

Breathing in excess of the physiological requirements removes excessive quantities of carbon dioxide from the blood and tends to produce alkalosis. Hyperventilation may be severe enough to overcome the compensatory mechanisms, and the pH of the blood then rises above the accepted upper limit of normal (7.45). Symptoms that result include tingling of the fingers and toes, numbness of the face followed by carpopedal spasm and ultimately by generalized spasms, convulsions, delirium and disorientation.

Alkalosis due to hyperventilation may be induced in a number of ways as outlined by Peters,[2] and Cantarow and Trumper [3]: acute hyperventilation, which occurs in unstable persons under sudden emotional stress; fever hyperventilation, which occurs because of increase in body temperature; high external temperature, which, if prolonged, may result in primary carbonic acid deficit; anoxic anoxemia, which occurs as a result of high altitudes and lowered atmospheric oxygen tension, producing the primary carbonic acid deficit; lesions of the basal ganglia, such as encephalitis, which produce hyperventilation over long periods of time.

A review of the literature reveals no clinical reports of hyperventilation alkalosis. Three cases of respiratory alkalosis are presented to illustrate several unusual features and to further emphasize the importance of venous blood pH determinations in the diagnosis and treatment of this disorder.

REPORT OF CASES

CASE 1.—Mrs. E. D., a 31 year old white woman, was admitted to the hospital in December, 1948, with the complaint, of two months' duration, of frequent attacks of shortness of breath associated with dryness of the mouth, a tight feeling, and a sensation of a "lump" in her throat. A constricting feeling in her chest usually followed. Occasional accompaniments were numbness of the upper lip, vertigo, and headache. Inventory of symptoms was noncontributory as was the past history. Physical examination revealed a somewhat obese (180 lb. [81.6 Kg.]) white woman, with blood pressure of 96/66. The pulse, temperature, and respirations were normal. The remainder of the physical findings were essentially normal.

Laboratory studies included the following data: Red blood count was 4,240,000, hemoglobin 94%, and white blood count 9,000. Differential blood count showed no abnormalities. The urine contained no albumin, sugar, or blood cells. Blood chemical studies (expressed in milligrams per 100 cc. except as indicated) showed nonprotein nitrogen 27, glucose 107, calcium 10.5, phosphorous 3.77, albumin 3.98 Gm., globulin 1.90 Gm., and cholesterol 206. Vital capacity was 3,400 cc. (normal 3,760). The electrocardiogram showed no diagnostic deformities. X-ray study of the chest revealed no cardiac or pulmonary pathology. Barium study of the esophagus was normal. Dehydrocholic acid (decholin®) circulation time was 14 seconds, and the venous pressure was 144 mm. of water.

During her hospital stay the patient experienced two minor episodes of dyspnea and tightness of the chest. These were very mild and disappeared gradually without treatment. A laryngoscopic examination during an attack was normal, and physical examination on both occasions was normal except for an increased rate of respiration. When the patient was asked to voluntarily hyperventilate for 10 minutes, a typical attack was reproduced except for the absence of chest distress. The hyperventilation test was then repeated after we had obtained an initial venous blood pH determination, which was 7.35.

After 12 minutes of hyperventilation, the venous blood pH rose to 7.55, and again the typical symptoms of the "attacks," including a constricting sensation of the chest and throat, numbness of the lips, dizziness, and headache, were produced and persisted for two hours, after which the patient again felt perfectly well. At present, 24 months after her discharge from the hospital, this patient continues to have only an occasional, mild, symptomatic episode, which is easily dissipated when she consciously slows her rate of respiration.

CASE 2.—G. S., a 56 year old white woman who was under observation for "anginal" pain syndrome at Wesley Memorial Hospital in March, 1948, was seen one evening because of sudden dyspnea. She complained of shortness of breath, a constricting sensation in her throat, and numbness of the face and both hands. The patient had a respiratory rate of 38 and severe carpopedal spasm. Her symptoms were dramatically relieved by reassurance, calcium gluconate given intravenously, and conscious effort on her part to slow her respiratory rate. The physical examination was essentially normal, and the past history was noncontributory.

The following information was obtained from the laboratory. The urine showed a trace of albumin but no sugar. Red blood count was 4,360,000, hemoglobin 83%, and white blood count 5,100, with a differential count within normal limits. Sedimentation rates were 17 and 20 mm. (normal under 20). Blood chemical studies (in milligrams per 100 cc.) showed nonprotein nitrogen 29.9, cholesterol 206, calcium 9.2, and phosphorous 4.3. Electrocardiograms taken at four day intervals were essentially normal and showed no diagnostic changes. X-ray examination of the chest was considered to be within normal limits.

Two days after the above described attack, a hyperventilation test, as outlined earlier, was carried out. Venous blood pH prior to the test was 7.37, and after only five minutes of active hyperventilation, the typical symptoms of which she originally had complained were reproduced, including dizziness, slight headache, numbness of face, and tingling and numbness of the hands; no carpopedal spasm developed, however. Blood pH was 7.49. These symptoms were identical in onset and character with the attack experienced previously except for the absence of carpopedal spasm. At the present writing, 21 months later, the patient remains free of any distress and has had no symptoms suggesting a recurrent episode.

CASE 3.—Mr. T. R., a 40 year old white man, was under treatment at Wesley Memorial Hospital in February, 1948, for rheumatic heart disease manifested by mitral stenosis and insufficiency, aortic stenosis, auricular fibrillation, and marked decompensation. The patient was receiving routine treatment for decompensation, including low salt diet, digitoxin, aminophylline, oxygen, meralluride injection (solution mercuhydrin® sodium), and morphine. On the sixth hospital day he became irrational; he began to sing and talked constantly and incoherently. He became incontinent, uncooperative, and difficult to restrain. The diagnosis of a drug psychosis was considered, but because of the pronounced increase in the respiratory rate, a hyperventilation

From the Departments of Medicine, Wesley Memorial Hospital and Northwestern University Medical School.

1. Marquardt, G. H.: Recent Developments in the Treatment of Acidosis, M. Clin. North America **32**: 264, 1948.

2. Peters, J. P.: Water Balance in Health and Disease, in Duncan, G. G.: Diseases of Metabolism: Detailed Methods of Diagnosis and Treatment; A Text for the Practitioner, ed. 2, Philadelphia, W. B. Saunders Company, 1947, p. 316.

3. Cantarow, A., and Trumper, M.: Clinical Biochemistry, ed. 3, Philadelphia, W. B. Saunders Company, 1945, p. 283.

syndrome was thought more probable. No changes in medications were made. The venous blood pH was 7.62. Ammonium chloride therapy was instituted; 1 Gm. was given orally every four hours. The patient, though showing no change in his cardiac status, began showing some improvement 16 hours later, and 24 hours after ammonium chloride therapy was begun, he was completely rational, coherent, and cooperative. Venous blood pH at this time was 7.45. The patient's cardiac status continued to improve slowly, and no recurrence of alkalosis developed.

Three months after discharge from the hospital, he remained compensated on a limited activity basis, and no further bouts of alkalosis had been experienced.

COMMENT

We feel that respiratory alkalosis is an easily produced and probably often overlooked syndrome. As pointed out by Peters [2] and others, in patients who have a slight, asymptomatic, preexisting alkalosis from other causes such as vomiting or excessive alkaline therapy, only moderate hyperventilation is required to precipitate severe symptoms.

The cases presented represent typical hyperventilation syndrome. The alkalosis in cases 1 and 2 was the result of unconscious hyperpnea in usually stable persons and presented a diagnostic problem in differentiation from cardiac disease. Case 3 illustrates the extremes to which this process may go and the importance of prompt and accurate diagnosis and treatment in an acutely ill patient.

Venous blood pH determinations were made on a standard Coleman pH meter, as previously described by one of us (G. H. M.).[1] A sealed glass electrode chamber is fitted with a sterile 2 inch length of rubber tubing, to the end of which is attached a sterile 1 inch needle. To the aspirating side arm of the chamber are attached another 1 inch length of rubber tubing, a thumb clamp, and a 2 cc. syringe. The pH meter is standardized prior to each determination with a standard buffer solution of pH 7.4. About 2 cc. of sterile water is drawn into the chamber. The patient's arm is cleansed with alcohol, a tourniquet placed above the elbow, and 1 cc. of blood is drawn from a vein into the vertically held chamber. The tubing and needle are removed from the chamber, and the latter is placed immediately in the meter. The pH is read directly. Readings are obtained 10 to 20 seconds after the needle punctures the vein and usually 20 to 40 seconds after the application of the tourniquet.

The practicability of venous blood pH determinations has been previously discussed.[1] Furthermore, the ease and rapidity of the test makes it a most valuable clinical aid in the correct interpretation of acid-base disturbances.

SUMMARY

The practical clinical application of venous blood pH determinations is illustrated by three cases of alkalosis due to primary carbonic acid deficit caused by hyperventilation. The value of venous blood pH determinations in acid-base disturbance is discussed, and the etiology of hyperventilation alkalosis is reviewed.

Pathology.—Pathologists in charge of hospital laboratories should be trained and interested in clinical pathology. The primary fixation on, and interest in, pathologic anatomy by many who call themselves pathologists is probably the greatest sin in pathology today. . . . Clinical pathology in the small and medium-sized hospital is in the hands of technicians, and this is not good medicine.—Trends in Pathology, *American Journal of Clinical Pathology*, May, 1951, pp. 464-467.

CARDIAC ACCIDENTS FOLLOWING VASOPRESSIN INJECTION (PITRESSIN®)

Irvin L. Slotnik, M.D., Milwaukee
and
Joel D. Teigland, M.D., Wood, Wis.

Vasopressin injection (pitressin®) has become widely accepted as a useful aid in roentgen visualization of the gallbladder. Through its ability to increase peristalsis, vasopressin injection results in rapid expulsion of gas from the intestine, thus removing obscuring gas shadows. The drug may cause only transient and minor toxic reactions. Collins and Root [1] recognized three contraindications: coronary heart disease, hypertension and hypotension (systolic blood pressure under 100). Kirklin [2] in reporting on the use of vasopressin injection in 100 cases, noted no serious ill effects although numerous minor reactions were observed, the most frequent being pallor. Recently, Mills and co-workers [3] directed attention to the possibility of serious myocardial effects of the drug. We observed two cardiac accidents following vasopressin injection during cholecystography. On the basis of generally accepted principles governing its use, no contraindication to the use of the drug was evident in these cases.

REPORT OF CASES

CASE 1.—A man, 63, was hospitalized for upper abdominal pain of two weeks' duration, occurring after fatty foods were eaten and accompanied by vomiting. There was no history of heart disease and no symptoms referable to the cardiovascular system, except for shortness of breath on unusual exertion. The blood pressure was 130/80 in both arms, there was no cardiac enlargement, and no thrills or murmurs were detected. Abdominal examination revealed no evidence of disease. The white blood cell count, sedimentation rate and blood reaction to the Kahn test were normal. A chest roentgenogram and teleoroentgenographic heart studies did not reveal heart disease. An electrocardiogram on the day after admission, including the three standard leads, unipolar precordial leads and unipolar limb leads, was normal.

Because of the history of abdominal pain and fatty food intolerance, gallbladder studies were requested. On April 18, 1949 at 8:00 a. m., the patient was given hypodermically 1 cc. of vasopressin injection with a pressor activity equivalent to 20 U. S. P. posterior pituitary units. (The roentgenograms were subsequently reported as revealing a nonfunctioning gallbladder containing stones.) Five hours after the vasopressin injection, he suddenly complained of severe left precordial pain, radiating into the left shoulder. At this time the patient was in acute distress, dyspneic and bathed in cold perspiration. The blood pressure was 120/90 and ten minutes later fell to 100/80. The pulse was rapid but regular, and the heart sounds were somewhat decreased in volume as compared to previous observations.

From the Veterans Hospital, Wood, Wis., and the Marquette University School of Medicine, Milwaukee.

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1. Collins, E. N., and Root, J. C.: Elimination of Confusing Gas Shadows During Cholecystography by Use of Pitressin, J. A. M. A. **107**: 32 (July 4) 1936.

2. Kirklin, B. R., and Seedorf, E. E.: Clinical Study of Reactions Following Employment of Pitressin in Cholecystography, Am. J. Roentgenol. **42**: 811-819, 1939.

3. Mills, M. D.; Burchell, H. B.; Parker, R., and Kirklin, B. R.: Myocardial Infarction and Sudden Death Following Administration of Pitressin: Additional Electrocardiographic Study of 100 Patients Given Pitressin for Cholecystography, Proc. Staff Meet., Mayo Clin. **24**: 254, 1949.

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There were no abnormal abdominal findings. Clinically, the patient appeared to have had an acute coronary thrombosis.

An electrocardiogram taken that day revealed changes compatible with myocardial infarction. Serial electrocardiographic tracings subsequently showed progressive changes typical of anteroseptal myocardial infarction. The sedimentation rate (Westergren) rose to a peak of 80 and then gradually fell to normal over a period of four weeks, paralleling his clinical course. On the therapeutic regimen for coronary thrombosis, the patient made an uneventful recovery.

CASE 2.—A man aged 54 was admitted with a history of recurrent epigastric distress of 12 years' duration, relieved by ingestion of food and antacids. He complained, in addition, of occasional nausea and vomiting. Physical examination and a chest roentgenogram revealed no evidence of pulmonary disease. The heart was not enlarged to percussion, the rhythm was regular, and the rate was 88. Thrills or murmurs were not detected, and the blood pressure was 140/88. Tenderness was noted in the left epigastrium, but no other abdominal abnormalities were present.

On a Sippy regimen, antacids and antispasmodics, the symptoms subsided within 48 hours. A gallbladder series was reported as unsatisfactory due to overlying gas in the bowel. For this reason 1 cc. of vasopressin injection was given hypodermically to rid the bowel of gas and the cholecystogram was repeated. Four hours after receiving the drug the patient complained of moderate shortness of breath followed by nausea and vomiting. The dyspnea suddenly increased, and he became exceedingly apprehensive, clutching at his chest as though in severe pain. He was cold, pale and clammy. His blood pressure was 60/40, the pulse was rapid and regular, and the heart sounds were faint and distant. There were no abnormal abdominal observations. In spite of emergency treatment the patient died within 30 minutes.

At autopsy the heart revealed an old posterior wall myocardial infarction and some concentric hypertrophy of the left ventricle. Healed rheumatic mitral disease without stenosis was present. The coronary vessels showed atheromatous changes with narrowing but no obstruction of the lumens. Some pulmonary congestion with hemosiderosis of the lung was observed. The gallbladder was free of disease.

Death in this case can be attributed to acute coronary insufficiency induced by vasopressin injection. Myocardial ischemia, when prolonged, will lead to myocardial infarction. No actual vascular occlusion is required for infarction to

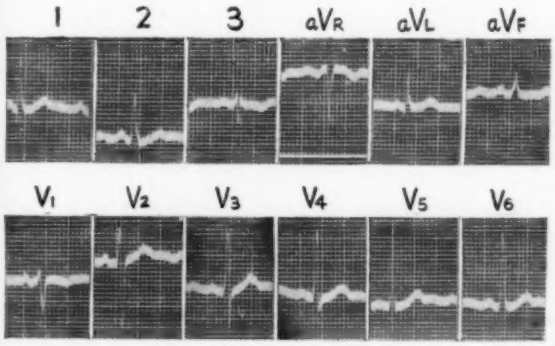

Fig. 1 (case 1).—Electrocardiogram with unipolar limb leads and precordial V leads taken one week before the administration of vasopressin injection.

occur; in fact, myocardial infarction without occlusion is by no means unusual. Such prolonged ischemia is a characteristic effect of vasopressin injection, and its results are most damaging when underlying coronary disease is present, as was the case in our second patient.

The absence of myocardial infarction at postmortem examination is as expected, since patients who die after coronary occlusion do not show the usual pathological changes unless they survive six to 12 hours. This length of time is required for the development of necrosis.[4]

COMMENT

That vasopressin injection could be responsible for cardiac accidents is not surprising in view of the experimental work which has been done. Posterior pituitary extract has been shown to have a definite effect not only on the blood vessels and blood pressure but on

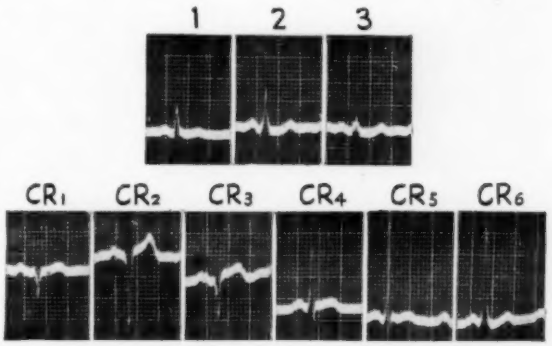

Fig. 2 (case 1).—Electrocardiogram with precordial CR leads taken seven hours after the administration of vasopressin injection.

the heart itself. As early as 1895 the ability of this drug to produce capillary and arteriolar constriction was demonstrated. It was first believed that this vascular constriction was associated with a rise in blood pressure similar to that seen with epinephrine.[5] Later, however, it was shown in the unanesthetized animal and in human subjects that a rise in blood pressure does not occur in spite of capillary constriction. A drop in blood pressure is, in fact, much more characteristic.[6]

It has also been demonstrated that pituitary extract results in a slowing of the pulse, associated with sinoauricular block and auriculoventricular block. This response cannot be prevented by administration of atropine or section of the vagi, thus illustrating a direct cardiac effect.[7]

Kamm and associates [8] succeeded in separating pituitary extract into its oxytocic factor and its vasopressor and antidiuretic principle. The vasopressor principle is now known as vasopressin injection (pitressin®), while the oxytocic factor is called oxytocin injection (pitocin®). Experimental work in man utilizing vasopressin injection has revealed essentially the same effects as shown with the crude extract in animals. That a rise in blood pressure does not occur in man was demonstrated by Grollman and Geiling,[6b] who also noted a decrease

4. Anderson, W. A. D.: Pathology, St. Louis, C. V. Mosby Company, 1948.

5. Oliver, G., and Schaefer, E. A.: On the Physiological Action of Extracts of Pituitary Body and Certain Other Glandular Organs, J. Physiol. **18**: 277-279, 1895.

6. (*a*) Kolls, A. C., and Geiling, E. M. K.: Pharmacology of Extracts of Posterior Lobe of Pituitary Gland, J. Pharmacol. & Exper. Therap. **24**: 67-81, 1924. (*b*) Grollman, A., and Geiling, E. M. K.: Cardiovascular and Metabolic Reactions of Man to Intramuscular Injection of Posterior Pituitary Liquid (Pituitrin), Pitressin and Pitocin, ibid. **46**: 447-460, 1932.

7. Resnik, W. H., and Geiling, E. M. K.: Action of Pituitary Extract on Heart of Unanesthetized Dog, J. Clin. Investigation **1**: 217-238, 1924-1925. Gruber, C. M., and Kountz, W. B.: Observations on Effect of Pitressin on Blood Pressure, Pulse Rate and Respiration in Dogs, J. Pharmacol. & Exper. Therap. **39**: 275-299, 1930.

8. Kamm, O.; Aldrich, T. B.; Grote, I. W.; Rowe, L. W., and Bugbee, E. P.: The Active Principles of the Posterior Lobe of the Pituitary Gland: I. The Demonstration of the Presence of Two Active Principles: II. The Separation of the Two Principles and Their Concentration in the Form of Potent Solid Preparations, J. Am. Chem. Soc. **50**: 573-601, 1928.

in heart rate and cardiac output. Collins and Root [1] noted an occasional slight but transient rise in blood pressure. In none of their cases, however, was the blood pressure as high at the end of one hour as it had been before vasopressin injection was given.

Probably the most significant effect of vasopressin injection is its effect on the coronary circulation.[9] Numerous investigations have confirmed that the coronary blood flow is decreased with persistence of this effect for as long as 45 minutes. Green was able to demonstrate intense coronary constriction with depression of the myocardial contractility.[10] In 1944 Dearing, Barnes and Essex [11] showed that acute myocardial degeneration could be produced in cats by administration of large doses of vasopressin injection. That this effect could be produced only in the old animals is particularly interesting in view of the fact that the cardiac accidents which we observed both occurred in older patients. Ruskin [12] actually utilized this deleterious effect of vasopressin injection on the coronary circulation as a test of coronary insufficiency. He demonstrated resulting bradycardia, premature beats, and S-T and T wave changes.

A significant and peculiar characteristic of vasopressin injection is the long duration of myocardial ischemia which it can produce and its unusually long latent period. This is well illustrated by our two cases, in which four and five hours passed before the cardiac effects became evident. Similar observations were made by Mills in his four cases in which latent periods of 4 hours, 2 hours, 1½ hours and 20 minutes were noted prior to onset of cardiac symptoms. The prolonged ischemia is probably an important factor in the serious reactions which have been recorded, since it is well known that prolonged hypoxia, even of mild degree, can result in myocardial infarction.

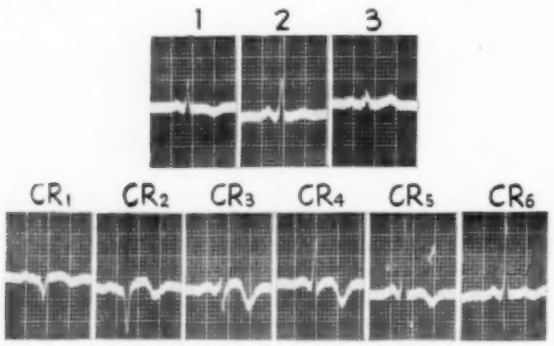

Fig. 3 (case 1).—Electrocardiogram with precordial CR leads taken three weeks after the administration of vasopressin injection.

Vasopressin injection is capable of serious and even fatal cardiac accidents in elderly patients. This is conclusively demonstrated by our cases and those of Mills. Whether it can produce such effects in the normal young heart is, however, by no means determined. Neither in our cases nor in those of Mills has underlying coronary heart disease been eliminated as a factor. In our one case with autopsy and in the two of Mill's cases with postmortem examination, old myocardial infarcts were found. In addition, all these cases are in the age group between 54 and 65, which suggests that coronary arteriosclerosis may have been a factor. A normal electrocardiogram such as we noted in our first case prior to the administration of vasopressin injection, and which was also noted in two of Mill's cases, does not rule out the possibility of underlying coronary heart disease. The frequent observance of normal electrocardiographic tracings even in persons with advanced coronary insufficiency is well recognized.

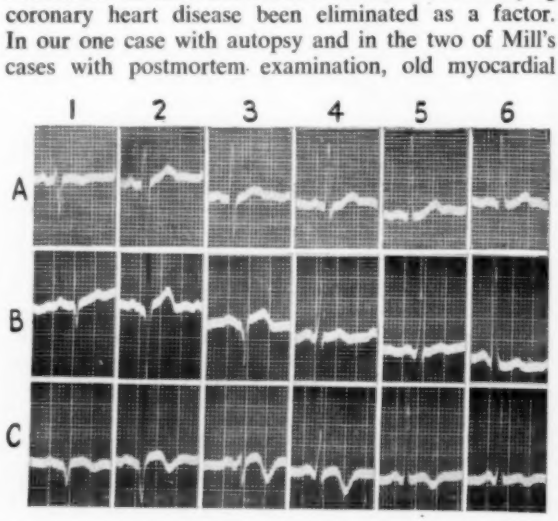

Fig. 4 (case 1).—*A*, precordial V leads taken one week prior to the administration of vasopressin injection; *B*, precordial CR leads taken three weeks after the administration of the drug, and *C*, precordial CR leads taken seven hours after its administration.

Certainly there is general agreement that vasopressin injection should be withheld in the presence of coronary insufficiency. It appears that a routine electrocardiogram before the utilization of vasopressin injection would be a wise procedure. Though an abnormal tracing contraindicates use of the drug, a normal electrocardiogram does not assure one that it can be given with impunity.

Perhaps it would be best to withhold vasopressin injection entirely in older persons. Great care must be taken to differentiate the symptoms of gallbladder disease from those of coronary insufficiency when the use of vasopressin injection is contemplated. That the symptoms of gallbladder disease can be mimicked by coronary insufficiency induced by a large meal is well known. Despite the fact that gall stones were found in our first patient, it is quite possible that his symptoms were actually those of coronary insufficiency.

SUMMARY

Vasopressin injection (pitressin®) has proved to be useful for the elimination of confusing gas shadows during cholecystography. It has been generally accepted as a safe medicament. Extensive experimental work in the past has demonstrated profound cardiovascular effects resulting from its use, the most important being

9. Essex, H. E.; Wegria, R. G. E.; Herrick, J. F., and Mann, F. C.: The Effects of Certain Drugs on the Coronary Blood Flow of the Trained Dog, Am. Heart J. **19**: 554-565, 1940.

10. Green, H. D.; Wegria, R., and Boyer, N. H.: Effects of Epinephrine and Pitressin on Coronary Artery Inflow in Anesthetized Dogs, J. Pharmacol. & Exper. Therap. **76**: 378, 1942.

11. Dearing, W. H.; Barnes, A. R., and Essex, H. E.: Experiments with Calculated Therapeutic and Toxic Doses of Digitalis; Comparative Effects of Toxic Doses of Digitalis and Pitressin on Electrocardiogram, Heart and Brain, Am. Heart J. **27**: 108, 1944.

12. Ruskin, A.: Pitressin Test of Coronary Insufficiency, Am. Heart J. **34**: 569-579, 1947.

a decrease in coronary blood flow. An instance of proved myocardial infarction and a death following the administration of vasopressin injection are reported. It is suggested that the drug be used with caution, if at all, in elderly patients.

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COMPLETE OBSTRUCTION OF THE ESOPHAGUS FOLLOWING SERUTAN® INGESTION

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In the course of hospital practice of radiology it is not uncommon to find obstruction of the esophagus in patients who have symptoms of brief duration. The commonest non-neoplastic obstruction is that resulting from impaction of meat or some other foreign body. The finding of obstruction of the lower end of the esophagus following the ingestion of the proprietary preparation known as serutan® is unique in our experience. In 1937 and also in 1939 saraka® (a hygroscopic gum laxative) was reported as causing esophageal obstruction.[1] Since that time we have seen no reports of such cases in the literature.

Serutan,® a bland granular hygroscopic substance, which is widely used as a remedy for constipation, is

Fig. 1.—Roentgenogram of barium in the esophagus, right anterior oblique projection. The obstruction is complete. Note inverted meniscus sign at the site of impaction, dilatation of the proximal esophagus and a slight spillage of the barium into the trachea.

said by the manufacturers to be a hydrogel derived from Plantago ovata and extracted sugar beets from which the roughage has been removed. Apparently, serutan® owes its laxative properties to its gelatinous, spongy character and its ability to absorb and retain liquids, with a corresponding increase in bulk.

Because of the rarity of this type of esophageal obstruction, the following case is reported in brief.

REPORT OF CASE

H. B., a 75 year old white man, was referred to this hospital by his family physician on March 3, 1950, complaining of pain in the chest, a feeling of "bursting" behind the sternum and inability to swallow.

Fig. 2.—Postoperative roentgenogram of barium in the esophagus, right anterior oblique projection. The obstruction has been removed. The esophagus appears normal.

The patient stated that he was troubled with constipation and that on March 11 he took two doses of serutan® without untoward symptoms. He took two doses in the same manner on the following two days, March 12 and 13. On March 14 he swallowed the serutan® in the following manner: Two teaspoonfuls of dry serutan® was placed in a cup and 1 teaspoonful was swallowed and washed down with a few sips of water. The second teaspoonful was then taken and washed down with the remainder of a glass of water.

Within five minutes after ingestion of the laxative the patient had a feeling of oppression and felt that his "gullet" was filling up. He expectorated a great deal of mucoid and salivary material which he estimated to be about 1 pint (473 ml.). Pain developed in the epigastric and retrosternal regions and continued and increased in severity until the time of his admission. After the development of these symptoms he was unable to swallow anything. The patient went to bed but had so much pain and salivation that he was unable to sleep. His physician gave him tablets, which he chewed and swallowed. This caused him to gag, bringing up a considerable quantity of liquid mucoid material, the fragments of the tablets and a chunk of sticky, tough material that he estimated to be 1½ or 2 inches long (3.8 or 5 cm.), resembling a piece of sausage. The patient stated that this looked like some of the serutan® which he had taken. The symptoms of obstruction persisted all night in spite of a morphine injection, and the next morning he was admitted to the hospital.

From the Department of Radiology, George F. Geisinger Memorial Hospital and Clinic.

1. Goldman, J. L.: Esophageal Obstruction from Hygroscopic Gum Laxative (Saraka), J. A. M. A. **108**: 1408 (April 24) 1937. Waltz, M. R.: Esophageal Obstruction Resulting from Injudicious Method of Ingesting Hygroscopic Gum Laxative (Saraka): Esophagoscopic Removal, ibid. **112**: 229 (Jan. 21) 1939.

Physical examination was noncontributory except for evidence of arteriosclerosis. The diagnosis of obstruction was made at once, and the patient was given papain suspension, which was regurgitated promptly. Urinalysis of a specimen secured on admission and all laboratory tests revealed no abnormality except for a white blood cell count of 18,200, of which 86 per cent were polymorphonuclear cells.

Roentgenological Examination.—Under fluoroscopic control the patient was given a drink of barium sulfate suspension. There was complete obstruction in the lower third of the esophagus, and no barium entered the stomach. The inferior end of the barium column in the esophagus outlined a smoothly rounded mass, and in the erect position some of the barium tended to surround the mass, producing the typical inverted meniscus sign frequently associated with meat impaction. The esophagus was somewhat dilated proximal to the obstruction, and some of the barium spilled over into the trachea, producing a paroxysm of coughing (fig. 1).

Esophagoscopy.—On March 15, 1950, a 9 mm. by 53 cm. full lumen esophagoscope was introduced without difficulty. The esophagus contained a large amount of saliva and some barium. After this was aspirated the mucosa was found to be edematous and congested. Three inches (7.6 cm.) above the diaphragm the lumen was completely obstructed by pasty, granular, brown material that looked somewhat like brown sugar. It was sticky and cohesive and was removed with great difficult as the aspirator frequently became clogged. Some of the material was removed with forceps. The mucosa in the area of the obstruction was noted to be extremely dry, granular and inflamed.

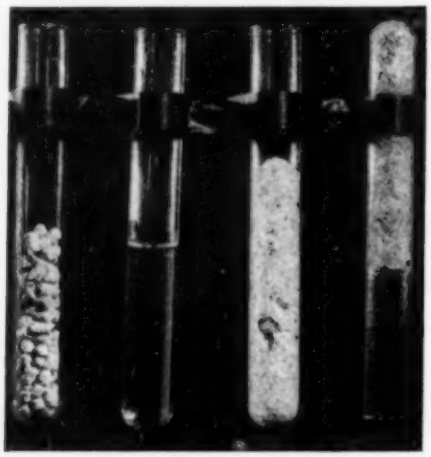


Fig. 3.—Simple test tube demonstration: tube 1, dry serutan®; tube 2, water; tube 3, water and serutan,® mixed; tube 4, water and serutan mixture inverted without spilling.

After the removal of all of the material, a no. 20 bougie was passed into the stomach without further obstruction.

Hospital Course.—The patient was given dihydrostreptomycin, 0.7 Gm. intravenously twice a day, and also fortified crystalline procaine penicillin G (duracillin®) 400,000 units every six hours, in order to combat the local esophagitis.

After the removal of the impaction, the symptoms disappeared. The patient was able to swallow, and reexamination of the esophagus, stomach and duodenum by roentgenoscopic and roentgenographic means disclosed no abnormal findings in the esophagus or stomach. The normal postoperative roentgenogram is reproduced in figure 2.

FURTHER INVESTIGATIONS

Because of the unusual interest of this case, a supply of serutan® was secured from a local drug store, and the hygroscopic nature and interesting physical properties of the substance were investigated. It was found that when water was added to the dry serutan,® the granular material quickly became wet, swollen and spongy. If insufficient water was added, a semisolid gel was formed which on standing became firmer and firmer. When equal quantities of serutan® and water were mixed together in a test tube, the mixture stiffened so quickly that in 30 seconds it was possible to invert the tube without spilling the contents.

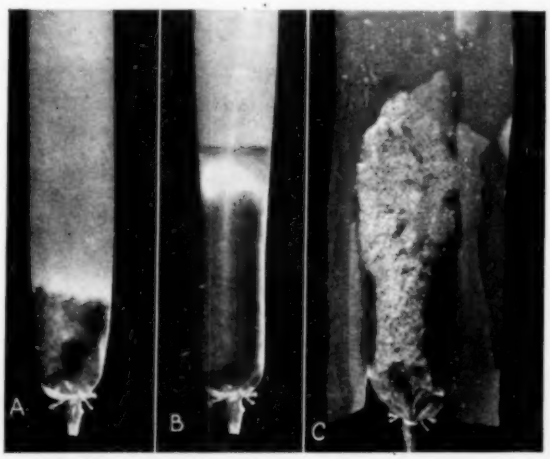


Fig. 4.—*A*, dry serutan® in a 1 inch (2.5 cm.) rubber Penrose drain. *B*, water added to serutan® in the rubber drain. Material is swollen, spongy and granular but firm to palpation 30 seconds later. *C*, rubber drain cut open, exposing the wet, gelatinous, cohesive serutan® that retains the form of the tube.

A simulated esophagus was made by tying off a piece of rubber Penrose surgical drain 1 inch (2.5 cm.) in diameter. When serutan® and water were mixed in this drain, it was found that considerable swelling took place and that within 30 seconds the mixture became quite firm to palpation. Within two minutes an impaction had formed which was so firm that when the rubber tubing was cut open, the sausage-like mass could be held easily in the fingers (fig. 4 and 5).

Fig. 5.—Two minutes after addition of water the serutan® can be held in the fingers much like a piece of sausage.

COMMENT

From the results of the simple experiments described above, the patient's history and the absence of demonstrable esophageal disease we formed the opinion that the unusual obstruction of the lower end of the esophagus in this patient was the result of the rapid swelling of the

serutan® during its passage through the esophagus. It is likely, of course, that there was some delay in the esophagus as the result of temporary cardiospasm or other transient constriction. No organic disease of the esophagus was found that might explain the delay which presumably occurred. Probably the patient swallowed an insufficient amount of water with the dry serutan,® and the limited amount of water favored the production of a semisolid mass which obstructed the lumen; hence when the remainder of the glass of water was ingested, the impaction was already present. The local esophagitis noted at the time of esophagoscopy was presumably the result of local dehydration of the mucosa, together with continued swelling of the serutan® mass, producing stretching of the esophageal walls. It would seem wise to advise patients who use the substance, or other similar hygroscopic substances, to observe the precaution of ingesting copious amounts of water or other liquids that will quickly wash it into the stomach before impaction can occur in the lower esophagus.

SUMMARY

An unusual case of esophageal obstruction is reported. This presumably resulted from the ingestion of dry serutan® followed by an insufficient fluid intake. The typical roentgenological characteristics of such an impaction are presented.

COUNCIL ON PHARMACY AND CHEMISTRY

The Council on Pharmacy and Chemistry has authorized publication of the following report to the Council.

R. T. STORMONT, M.D., *Secretary.*

RADIOACTIVE ISOTOPES IN MEDICAL RESEARCH, DIAGNOSIS, AND THERAPY

F. E. Kelsey, Ph.D., Chicago

Since the Isotopes Division of the Oak Ridge National Laboratory began the distribution of isotopes for research and therapy in 1946, over 10,000 shipments have been made, more than 40% of which were for medical research, diagnosis and therapy.[1] A large number of radioactive isotopes have been synthesized both by neutron bombardment in a nuclear-reacting pile and by cyclotron. Extensive biologic or medical applications have been made with phosphorus 32, iodine 131, sodium 24 and carbon 14.[2] Radioactive isotopes are generally available in an elemental state or as simple ionic compounds, although the number of radioactive organic compounds that have been synthesized is increasing rapidly.

A radioactive isotope differs from one which is not radioactive only in the composition of the atomic nucleus, generally because of an extra neutron. In most biologic reactions, this additional neutron does not affect the chemical properties of the atom sufficiently to enable living organisms to differentiate the isotope from its natural counterpart. Minor differences in reactivity may be demonstrated; for example, the heavier atom diffuses more slowly, but it still can be used as a tracer in metabolic studies.

The changes in the nucleus cause instability of the atom, and disintegration may occur suddenly. This lack of stability, characteristic of all radioactive isotopes, varies extremely from one isotope to another. The time required for disintegration may be a fraction of a second or several million years. Since stability of the nucleus cannot be increased or decreased by any external factors, the time required for disintegration of half of the atoms in any given amount of material containing isotopes is a direct function of the nuclear stability of each radioactive isotope. This property is referred to as the "half-life" of the isotope (see table). Isotopes with a relatively short half-life are safer for clinical use, since the dose of radiation is limited regardless of the persistence of the element in the body. Radioactive sodium, for example, with a half-life of 14.8 hours, can be given in doses of 40 mc. In 14.8 hours, the amount remaining undecomposed is 20 mc.; in 29.6 hours, 10 mc.; in 44.4 hours, 5 mc.; and, in 3.7 days (6 half-lives) only 0.625 mc. remains.* On the other hand, an isotope with a longer half-life can be stored over a longer period of time without appreciable loss of activity.

The biologic effect of an internally administered isotope depends on the nature and intensity of the radiations, the half-life of the isotope, its persistence in the body, and its distribution pattern in the body. For example, the high degree of persistence and the selective localization of radium in the bones result in important biologic effects with doses of radioactivity hundreds of times less than that required with isotopes, such as sodium 24 or phosphorus 32, which are more evenly distributed throughout the body. Furthermore, large doses of any radioactive isotope must be administered slowly, or in high dilution, to prevent local damage at the site of administration. Similarly, some isotopes such as iodine 131 and phosphorus 32, are excreted rapidly and may damage the kidney and bladder.

When a radioactive atom disintegrates, the molecule carrying it is shattered and emanations of the beta, gamma or, less frequently, alpha and neutron types, are emitted from the nucleus. The biologic effects resulting from this disintegration are caused largely by these emanations rather than by the destruction of the molecule.

Alpha particles are heavy, doubly-charged particles composed of two neutrons and two protons and are identical with the nucleus of the helium atom. They produce intense, but localized, damage since they collide with other atoms in the immediate vicinity (within 0.05 mm.) more frequently than do the lower-charged and smaller beta particles.

Beta particles are high-speed electrons having a penetrating power up to 8 mm. (for phosphorus 32) in tissue, but their effects are primarily restricted to the immediate vicinity of the disintegration.

Gamma rays are similar to x-rays and penetrate many centimeters, influencing the intermediate tissues.

Neutrons, because they lack an electrical charge, also penetrate deeply but produce local effects from initial collision anywhere along the track.

The speed acquired by the emanations alters their penetration of tissue. High-energy (fast) neutrons are less subject to collision or capture than low-energy (slow) neutrons. Extremely high-energy beta particles produced by a betatron also have a longer range in tissue. Their high speed permits them to penetrate relatively deep before any appreciable ionization is produced. Since this depth is determined by the original energy of the electron, the betatron can be used to produce intense ionization at predetermined depths, as in the treatment of a deep-seated cancer.[3]

HEALTH HAZARDS AND CONTROL MEASURES

The hazards involved in the use of radioactive isotopes are difficult to evaluate since there are no detectable biologic effects which can be used to discover incipient injury. Since the incidence of leukemia and allied diseases is ten times greater among radiologists than among other physicians, it is evident that the blood-forming organs are sensitive to radiations. Measurement of peripheral blood changes is the best control measure available, but these changes vary among persons and daily in the same person. The methods for measuring the hematologic constituents lack precision also.[4] Routine x-rays of workers who may

Because of lack of space, the bibliographic references have been omitted from THE JOURNAL. They are, however, included in the author's reprints.

* The most commonly used unit of measure for radioactive isotopes is the millicurie (mc.) which is defined as the amount of isotope giving 2.2×10^9 disintegrations per minute. It is roughly equivalent to the number of disintegrations occurring in one milligram of radium.

be exposed to radiation should be taken as seldom as possible because of the additive effect.

The intensity of radiation in an exposure area must be measured to determine the maximum time a person may receive a "permissible" amount of radiation. The permissible limits have been determined on the basis of past experience with roentgen rays and radioactive isotopes occurring naturally (such as radium) as well as from work with animals. This determination is often only an estimate, since the life span of experimental animals is too short to predict the effect on a human being exposed for many years.[5]

The greatest health hazard involved is the accidental ingestion of radioactive isotopes orally or by inhalations of vapors or dusts. Appreciation of the distances over which the various types of emanations are effective is important. Consideration should be given to reflections and secondary radiation.[6] The total body radiation from cosmic rays received by an individual during a 70 year lifetime is 20 to 40 r. Internally deposited, naturally-occurring radioactive isotopes add another 2 to 5 r to this amount. A chest x-ray results in an exposure of 0.4 to 2 r, and a complete gastrointestinal series may amount to as much as 40 to 75 r. Therapeutic application of roentgen rays to limited areas, as in the treatment of skin carcinomas, may be equivalent to 5,000 r or more. The fatal dose of total body irradiation in human beings has been estimated at 400 r. For rats the fatal dose is 825 to 900 r, for guinea pigs 250 r, and for paramecia 300,000 r.

Radioactive Isotopes

			Penetrability of Radiation (Cm.)		
			Beta Radiation		Gamma Radiation
Element	Atomic Weight	Half-Life	Maximum Range in Air	Maximum Range in Tissue	50% Absorption in Tissue*
Hydrogen	3	12.1 y	0.1	0.0002	..
Carbon	14	5600 y	20.0	0.027	..
Sodium	24	14.8 hr	18.0	0.024	17
Phosphorus	32	14.3 d	600.0	0.8	..
Sulfur	35	87.1 d	25.0	0.032	..
Chlorine	36	1,000,000 y	190.0	0.24	..
Calcium	45	180.0 d	46.0	0.060	..
Iron	59	46.3 d	100.0	0.13	10
Iodine	131	8.0 d	180.0	0.23	9
Gold	198	2.7 d	340.0	0.44	8

* Where no figures appear, there is no gamma emission.

Government regulations concerning the use of radioactive isotopes produced by the Atomic Energy Commission are relatively strict and formalized.[7] The Oak Ridge National Laboratory, through its Isotopes Division, is responsible for evaluating and approving an organization's facilities and the qualifications of the physicians and research workers desiring to use radioactive isotopes in human experiments. Approved medical organizations (hospitals, clinics, research organizations) must possess adequate facilities for assaying, handling, and disposing of the radioactive materials as well as for the clinical care of the patient. The physician in charge of the radioactive material must have had previous experience in this field, or be directly collaborating with someone who has such experience, and must be in good standing with the local medical society. The Atomic Energy Commission also recommends that the institution appoint an "isotope committee" to approve all proposals for the use of radioactive isotopes in that institution. This committee should consist of a physician trained in internal medicine, a hematologist, an individual experienced in the handling and use of radioactive isotopes who is familiar with the necessary precautions as to shielding and disposal, and a physicist and therapeutic radiologist, at least available as consultants. Further, special permission is required for the use of isotopes having a half-life of more than 30 days, because of their greater potential hazard.

ANALYSIS FOR RADIOACTIVE ISOTOPES

A characteristic property of the emissions from radioactive decay is their ability to produce ionization by collision with other atoms, resulting in the formation of free electrons. These free electrons are easily and rapidly measurable by such instruments as the Geiger counter, the scintillation counter, and the ionization chamber. The Geiger counter, the most versatile and flexible radiation detector, consists of two electrodes, the cathode being a hollow tube and the anode a fine wire suspended along the longitudinal axis of the tube. When an ionizing particle enters the tube, a few free electrons are formed and accelerated toward the center wire. When their speed is great enough, additional electrons are formed by collision with the gaseous atoms, and these are also accelerated toward the center wire. This multiplication process is referred to as an "avalanche" and results in an electric pulse produced when these thousands of electrons arrive at the center wire. The whole process is initiated by the original ionizing event, i. e., the radiation produced by the disintegrating atom. The apparatus thus records this disintegration. Geiger tubes have been designed in a number of shapes and sizes for specific uses. For example, detection of phosphorus 32 in intracranial tumors required the development of a Geiger tube that could be sterilized and used by the surgeon as a probe to pinpoint the source of radiation in the brain.[8]

In addition to the Geiger tube itself, a power supply and scaling circuit is needed. The latter is a rapid electronic recording device which actuates a mechanical recorder after a given number (usually 64) of ionizing events have been received. Integrating circuits are also used to show the counting rate directly, either on a meter or on a continuous recording device.

The use of the scintillation counter to replace the Geiger tube is a recent development. When this apparatus is employed, the radiation is absorbed in a crystal, resulting in a minute flash of light which is detected by a photomultiplier tube and amplifier. It is more efficient than the conventional Geiger counter for measuring gamma-ray emission.[9]

Ionization chambers which do not have internal-multiplying characteristics like the Geiger tube can be used for most work. These fundamentally simple devices use external amplification to measure the rate of fall of an impressed charge between two electrodes, a function of the radiation entering the chamber.

RADIOACTIVE PHOSPHORUS

Phosphorus 32 is a strong beta emitter with a half-life of 14.3 days. It is available as a solution of sodium phosphate with or without a small amount of nonradioactive sodium phosphate added as a carrier. Concentrations as high as 3 mc. per milliliter are obtainable. For each millicurie of radioactive phosphorus administered, the resultant total body irradiation is 10 roentgen-equivalents, which takes into account the half-life and the excretion of part of the dose. It can be given in single doses up to 7 mc. either intravenously or, in smaller doses, by mouth. About 75% of an oral dose is absorbed, the remainder being lost in the feces, and 20 to 40% of each dose is excreted quickly through the kidney. The rest is distributed unevenly throughout the tissues of the body. High concentrations are found in bone and bone marrow and in the liver, spleen, and lymph nodes. The concentration attained in neoplastic tissue may be two to five times that attained in the corresponding normal tissue. This degree of concentration is not sufficient to permit the use of doses adequate for effective irradiation of neoplasms but can be used with Geiger tube probes as a diagnostic aid.[8] The high concentration in bone and bone marrow permits the successful use of this isotope in polycythemia rubra vera. Single doses may result in remissions lasting 6 to 12 months.[10] Isotopic treatment of leukemia is not as successful, although some benefit may be derived,[11] and it is possible that leukemia may result from large doses of phosphorus 32.

The short effective range of the beta radiation of phosphorus 32 and the absence of gamma radiation makes possible the use of this isotope for local irradiation of the skin in conditions such as radio sensitive skin cancers, hyperkeratosis, verrucae, and hemangiomas.[12] Radioactive phosphorus has been used also to measure the effective circulation in an extremity [13] and to label red blood cells to determine red cell volume.[14]

RADIOACTIVE IODINE

Iodine 131 emits both beta and gamma radiation and has a half-life of eight days. The beta emission is responsible for the inhibitory effect on the tissues, while the gamma emission permits a quantitative evaluation of the site of deposition of the isotope

within the body. For this purpose a Geiger or scintillation counter is employed externally. Radioactive iodine is available as carrier-free sodium iodide in weak basic sodium sulfate solution containing up to 5 mc. per ml. It is given by mouth in doses of about 1 to 10 mc. and is rapidly absorbed from the gastrointestinal tract and distributed throughout the body. The percentage of retention of radioactive iodine depends on how much iodine pre-exists in the body and to what degree the thyroid gland is active. In normal persons, the thyroid gland will fix 10 to 25% of the dose, and the remainder will be excreted in the urine within 24 hours. In patients with hyperthyroidism, about 50 to 80% of the total dose may be fixed by the thyroid. In myxedematous patients fixation is 10% or less.

Radioactive iodine is used as a diagnostic aid to detect abnormal thyroid function. Various investigators consider this form of iodine particularly valuable for treating toxic goiter.[15] Its use for treating primary carcinoma of the thyroid has not been universally successful since, as a general rule, only low grade tumors, which usually can be cured by surgery alone, take up significant amounts of iodine 131.[16] However, radioactive iodine is of definite value in locating the site of thyroid cancer metastases.[17] Generally, the metastases concentrate iodine in considerably less amounts than does the normal thyroid gland; however, the uptake can be greatly increased by removing the thyroid surgically, by administering thyrotoxic drugs such as propylthiouracil, or by repeatedly administering iodine 131, which destroys the normal thyroid tissue. These procedures are effective probably because they increase secretion of the thyrotrophic hormone of the anterior pituitary and so stimulate the thyroid metastases that their ability to concentrate iodine is increased.[17a] Surgical removal of the normal thyroid is probably the most satisfactory procedure to stimulate the metastatic tissues to concentrate iodine.

The most serious side-effect observed in patients subjected to treatment with large doses of radioactive iodine is a depression of hematopoiesis. In some cases, the urinary bladder may be sufficiently irradiated to cause transient irritation.

RADIOACTIVE SODIUM

Sodium 24 emits both beta and gamma rays and has a half-life of only 14.8 hours. This makes prolonged storage of the isotope impossible, and therefore its use is restricted to centers close to a nuclear pile or a cyclotron. Radioactive sodium spreads rapidly throughout the tissues and fluids of the body, and, because of the gamma emission, can be detected by externally placed counters. The even distribution of sodium has prompted its use in patients with extensive metastases, although it appears to have no particular advantage over x-ray therapy, or as a substitute for total body x-ray in the treatment of such conditions as leukemia and polycythemia rubra vera.

Radioactive sodium has been most useful in the field of diagnosis. When injected intravenously, its course through the heart may be followed by an externally placed, and appropriately shielded, continuous recording counter. Characteristic curves for normal or abnormal cardiac dynamics may be obtained in this manner.[18] Sodium 24 also can be used to measure the extracellular fluid, since sodium is predominantly an extracellular ion. A measured dose of sodium 24 is given intravenously and a sample of plasma is taken later so that the dilution which has occurred with the sodium previously present can be measured. Circulation time can be measured in similar fashion.[19] Further, the time required to attain a constant level of radioactivity in a limb after administration of intravenous sodium 24 indicates whether circulation to that limb has been impaired. Thus, in thromboangiitis obliterans and arteriosclerotic occlusive disease, the uptake in the affected area is much slower. This delineates the area of impaired circulation and helps determine the best amputation site.[20] This isotope has also been used to estimate the efficiency of medical management of impaired peripheral circulation.[21]

RADIOACTIVE CARBON

Carbon 14 is a weak beta emitter with a half-life of 5,600 years. The long half-life of this carbon isotope makes long-term experiments practical; also, important organic compounds containing it may be stocked. On the other hand, the long half-life adds to the hazards of this isotope, since, once fixed in the body, it will continue to irradiate that part until it is excreted. The use of carbon 14 in human subjects therefore must be preceded by exhaustive experiments in animals in order to be certain that neither the isotopic compound itself, nor any isotope-containing metabolites that may be formed, is irreversibly fixed by any part of the body.

The low energy of the beta emission from carbon 14 makes this isotope more difficult to detect than those more commonly used. It is not possible to experiment on intact animals by using external counters. Further, when used for the assay of carbon 14 in isolated tissues, the Geiger counter must be constructed so as to allow the emitted beta rays free access into the counter's sensitive volume. This can be done by using a Geiger tube with a very thin window, usually mica,[2] or by inserting the material to be assayed directly into the counter.[22] Even in the latter case, self-absorption, i. e., the absorption of the beta rays by the material being assayed, can reduce the sensitivity of the analysis by a large factor. This is especially true when the amount of carbon 14 present is very small as compared to the amount of non-radioactive materials present.

Carbon 14 is easily the most useful radioactive isotope for medical research and possesses great potentialities for medical diagnosis and therapy. Since carbon is the basic substance common to all organic materials, a great variety of compounds containing it may be synthesized, useful for two purposes: (*a*) to afford a mechanism for carrying radioactivity to various specific parts and (*b*) to permit the study of metabolism of organic compounds. Although efforts to discover compounds specificially localized to certain tissues or cells have not been very succesful, this approach offers a possible solution to many medical problems.

The preparation of organic compounds containing carbon 14 often presents difficulties. Compounds which can be prepared by ordinary chemical synthesis are being studied in many laboratories. As the supply of chemical intermediates containing carbon 14 continues to increase, problems of synthesis will become easier to solve. However, many substances of great medical interest cannot be synthesized at the present time. Among these natural products are such drugs as the digitalis glycosides, many of the alkaloids (such as those of the opium and the ergot groups), some of the vitamins and sterols, and proteins. For the past four years the Department of Pharmacology at the University of Chicago has been studying the feasibility of growing plants in sealed chambers with the only source of carbon being the carbon dioxide added to the enclosed atmosphere. Varying amounts of carbon 14 can be added as radioactive carbon dioxide. The carbon 14 is thus incorporated at random into all of the constituents of the plant. By growing the appropriate medicinal plant, drugs labeled with carbon 14 can be obtained. To date, digitoxin and other digitalis glycosides,[23] morphine and other opium alkaloids,[24] nicotine,[25] and atropine [26] have been prepared from radioactive plants grown in the laboratory. Currently under investigation are convallatoxin, the veratrum alkaloids, muscarine, colchicine, khellin, marihuana, and the ergot alkaloids. Radioactive bufotoxin has been prepared [27] by using the tropical toad, Bufo marinus, which is fed on radioactive algae.

The following brief summary of some of the work with radioactive digitoxin illustrates the type of work possible with the aid of these new techniques. Digitoxin is rapidly metabolized to a number of compounds in experimental animals such as the cat, rat, and guinea pig. Whether the cardiac action is attributable to the unchanged digitoxin or to one of the uncharacterized metabolites cannot be determined until they have been isolated and tested, because there is no selective concentration of digitoxin in heart muscle of intact animals.[28] Since the radioactive digitoxin used in these experiments was labeled, in all positions, with carbon 14, all of the metabolites derived from it must conclusively be radioactive; thus, the isolation of these substances is possible. Experiments are also in progress using carbon 14 labeled digitoxin in human subjects.

OTHER RADIOACTIVE ISOTOPES

Radioactive gold is available as gold 198 or gold 199. These isotopes emit both beta and gamma radiation and are used chiefly in the form of colloidal gold injected directly into a tumor mass for local irradiation.[29] Ninety-nine per cent of the gold injected is permanently fixed at the site of injection. Since

the half-life of gold 198 is 2.7 days and that of gold 199 is 2.3 days, the radiation continues for a maximum of two to three weeks after fixation. This time is adequate to reduce the activity to less than 1/64 of the original dose. Radioactive gold has also been found useful in chronic leukemia.[30]

Radioactive arsenic has been tried without much success for the treatment of primary and metastatic carcinomas and polycythemia.[20] Radioactive cobalt is being used as a source of gamma radiation in place of radium.

SUMMARY OF ESTABLISHED USES OF RADIOACTIVE ISOTOPES

The principle of selective irradiation of specific tissues through the use of isotopes administered internally already has found clinical application.[31] Radioactive isotopes have been found equal or superior to other forms of therapy for the treatment of chronic myelogenous leukemia, chronic lymphatic leukemia, lymphosarcoma, giant follicular lymphoma, and polycythemia rubra vera. They are also of some value in Hodgkin's disease but are not helpful in acute leukemia and multiple myeloma.[32] Radioactive isotopes are useful in the diagnosis or treatment of some types of carcinoma, especially primary or metastasized carcinoma of the thyroid,[17] breast,[12] or testes.[33] They are the treatment of choice in many cases of hyperthyroidism.[15c] Externally applied, they are of use in the treatment of certain skin lesions.[12]

As diagnostic aids in locating the site of primary tumors or metastases, radioactive phosphorus as sodium phosphate, or radioactive iodine as sodium iodide or as diiodofluorescein,[14] may be used. Radioactive sodium can be used to diagnose disorders of the peripheral circulation and the heart.[19]

The availability of the radioactive isotopes for research furnished investigators with very sensitive new techniques.[34] These new methods make possible the solution of many long-standing problems concerning the metabolism of drugs, since they can be applied where no satisfactory chemical or biologic methods are presently known.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Diphtheria and Tetanus Toxoids, Alum Precipitated-U.S.P. (See New and Nonofficial Remedies 1950, p. 435).

Diphtheria-Tetanus Toxoids Combined (Alum Precipitated): 5 cc. vials (five immunizations). Preserved with thimerosal, 1: 10,000. Pitman-Moore Company, Division of Allied Laboratories, Inc., Indianapolis.

Diphtheria and Tetanus Toxoids, Alum Precipitated: 5 cc. (0.5 cc. dose form) and 10 cc. (1 cc. dose form) vials. Five immunizations each. Preserved with thimerosal 1: 10,000. E. R. Squibb & Sons, New York.

Diphtheria Toxoid and Pertussis Vaccine Combined, Alum Precipitated (See New and Nonofficial Remedies 1950, p. 446).

Diphtheria Toxoid, Alum Precipitated, and Pertussis Vaccine Combined: 6 cc. vials (1 cc. dose form). Two immunizations. 15,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. 7.5 cc. vials (0.5 cc. dose form). Five immunizations. 30,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. E. R. Squibb & Sons, New York.

Estradiol Benzoate-U.S.P. (See New and Nonofficial Remedies 1950, p. 320).

Solution Dimenformon Benzoate in Oil: 1 cc. ampuls. A solution in sesame oil containing 0.1 mg., 0.166 mg., 0.33 mg., 1.0 mg. or 1.66 mg. of estradiol benzoate in each cubic centimeter. Preserved with 0.8% methylparaben and 0.1% propylparaben. 10 cc. vials. A solution in sesame oil containing 0.33 mg. or 2.0 mg. of estradiol benzoate in each cubic centimeter. Preserved with 0.8% methylparaben and 0.1% propylparaben. U. S. Trademark 365,455. Organon, Inc., Orange, N. J.

Estrone-U.S.P. (See New and Nonofficial Remedies 1950, p. 328).

Aqueous Suspension Estrone: 10 cc. vials. A suspension containing 2 mg. of estrone in each cubic centimeter. Preserved with 0.5% phenol. The Bio-Intrasol Laboratories, Inc., Brooklyn.

Solution Estrone in Oil with Benzyl Alcohol 2%: 1 cc. ampuls and 10 cc. vials. A solution in sesame oil containing 1.0 mg. of estrone in each cubic centimeter. Preserved with 0.5% chlorobutanol. The Bio-Intrasol Laboratories, Brooklyn.

Meralluride Injection-U.S.P. (See New and Nonofficial Remedies 1950, page 273).

Solution Mercuhydrin Sodium: 10 cc. vials. A solution of meralluride containing the equivalent of 39 mg. of mercury and 48 mg. of theophylline in each cc. Lakeside Laboratories, Inc., Milwaukee, Wis.

Methapyrilene Hydrochloride (See New and Nonofficial Remedies 1950, p. 32).

Cream Semikon Hydrochloride 2%: 30 gm. tubes and 480 gm. jars. A cream containing 20 mg. of methylpyrilene hydrochloride in each gram. The S. E. Massengill Company, Bristol, Tenn.

Tablets Semikon Hydrochloride 2%: 50 mg. and 100 mg. The S. E. Massengill Company, Bristol, Tenn.

Penicillin for Oral Administration (See New and Nonofficial Remedies 1950, p. 139).

Tablets Crystalline Potassium Penicillin G (Buffered): 250,000 units. Buffered with 0.25 gm. calcium carbonate. Premo Pharmaceutical Laboratories, Inc., South Hackensack, N. J.

Pertussis Vaccine-U.S.P. (See New and Nonofficial Remedies 1950, p. 447).

Pertussis Bacterin (Whole Culture): 1.5 cc. vials (one immunization) and 7.5 cc. vials (five immunizations). 50,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. Sharp & Dohme, Inc., Philadelphia.

Pertussis Vaccine: 3 cc. (one immunization) and 15 cc. (five immunizations) vials. 30,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. E. R. Squibb & Sons, New York.

Phenobarbital Sodium-U.S.P. (See New and Nonofficial Remedies 1950, p. 404).

Solution Phenobarbital Sodium with Benzyl Alcohol 2%: 2 cc. ampuls. A solution in propylene glycol containing 0.13 gm. or 0.32 gm. of phenobarbital sodium in each cubic centimeter. Gold Leaf Pharmacal Company, Inc., New Rochelle, N. Y.

Polyamine-Methylene Resin (See THE JOURNAL, July 22, 1950, p. 1068).

Powder Exorbin: 1 gm. packets. Ayerst, McKenna & Harrison, Ltd., New York.

Tablets Exorbin: 0.25 gm. Ayerst, McKenna & Harrison, Ltd., New York.

Sodium Folate (See New and Nonofficial Remedies 1950, page 481).

Solution Folvite Sodium with Benzyl Alcohol 1.5%: 10 cc. vials. A solution containing 15 mg. of sodium folate in each cc. Lederle Laboratories, Pearl River, N. Y.

Thiamine Hydrochloride-U.S.P. (See New and Nonofficial Remedies 1950, page 488).

Tablets Thiamine Hydrochloride: 1 mg., 3 mg., 5 mg. and 10 mg. Physicians' Drug and Supply Company, Philadelphia, Penn.

Vitamin B_{12} (See New and Nonofficial Remedies 1950, page 492).

Solution Crystalline Vitamin B_{12}: 1 cc. ampuls. A saline solution containing 15 micrograms of vitamin B_{12} in each cc. Kremers-Urban Company, Milwaukee, Wis.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

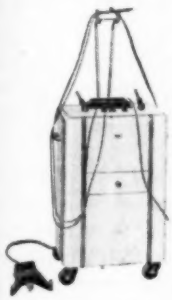
The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

HOWARD A. CARTER, *Secretary.*

BOVIE ELECTROSURGICAL UNIT, MODEL O-4, ACCEPTED

Manufacturer: The Liebel-Flarsheim Company, 303 West Third Street, Cincinnati 2.

The Bovie Electrosurgical Unit, Model O-4, is intended for use in all major and minor electrosurgical procedures. It consists of a cabinet that can be rolled about on casters; this has outlets for the cables that run to the operating electrodes. It also bears a cable for the power supply and a cable running to the footswitch assembly. This footswitch controls the current to the operating electrodes.



Bovie Electrosurgical Unit, Model O-4

For operation, the apparatus requires a source of 50 to 60 cycle alternating current at 115 volts. It draws 700 watts of power.

Unpacked, the apparatus measures 67 (height) by 48 by 33 cm. (26½ by 19 by 13 in.) and weighs 48.5 kg. (107 lb.). Packed for shipment it makes a crate measuring 95 by 56 by 70.5 cm. (37½ by 22 by 27¾ in.) and weighing 61 kg. (135 lb.). The foreign shipping weight is 96 kg. The shipping weights include the footswitch, two stainless steel indifferent plates, two chuck handles, endoscopic connecting cord and standard set of surgical electrodes.

Evidence from sources acceptable to the Council indicated that the device was satisfactory in construction and dependable for use in any surgical procedure where electrosurgery is indicated. The Council on Physical Medicine and Rehabilitation voted to include the Bovie Electrosurgical Unit, Model O-4, in its list of accepted devices.

M. S. A. DEMAND PNEOPHORE ACCEPTED

Manufacturer: Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh 8.

The M. S. A. Demand Pneophore is a device consisting of gas pressure gauges, regulating valves, tubing, and a face mask designed for use in administering oxygen and aerosols to patients. Unpacked, the apparatus weighs 6.8 kg. (15 lb.). Ready for shipment, it makes a package measuring 28 by 51 by 33 cm. (11 by 20 by 13 in.) and weighing 8.6 kg. (19 lb.). The foreign shipping weight is 23.6 kg. (52 lb.). It requires no source of power other than that furnished by the compressed gas in the cylinder.

M. S. A. Demand Pneophore

The device is designed to be useful for both "demand" and positive-pressure administration of oxygen. Because of this and because of the claims for therapeutic usefulness in such conditions as pulmonary edema, it appears that medical knowledge is necessary in determining not only which type of operation is adapted to a given case but also what pressure may be applied. Evidence of good construction and dependable performance was obtained from a laboratory acceptable to the Council.

The Council on Physical Medicine and Rehabilitation voted to include the M. S. A. Demand Pneophore in its list of accepted devices with the understanding that it should be used by physicians or under their direct supervision and that a physician should determine how it is to be used and what pressures may be applied in a given case.

DAHLBERG HEARING AID, MODEL D-1, ACCEPTED

Manufacturer: The Dahlberg Company, 2730 West Lake St., Minneapolis 16.

The Dahlberg Hearing Aid, Model D-1, was first introduced as the Tonex or Tru-Sonic, Model T-1. It is conventional in electrical design, but remarkable in that the microphone is attached to the clothing clip in such a way as to be outside the wearer's pocket or outer clothing. This clip measures 30 by 37 by 8 mm. The rest of the device measures 62 by 45 by 19 mm. Without batteries, cord, or receiver the device weighs 99 gm. The batteries add 27 gm., and the cord and receiver add 12 gm.

Dahlberg Hearing Aid, Model D-1

Evidence of satisfactory construction and performance was obtained from sources acceptable to the Council. The Council on Physical Medicine and Rehabilitation voted to include the Dahlberg Hearing Aid, Model D-1, in its list of accepted devices.

PARAVOX HEARING AID, MODEL J (TINY-MYTE), ACCEPTED

Manufacturer: Paravox, Inc., 2056 East Fourth Street, Cleveland 15.

The Paravox Hearing Aid, Model J (Tiny-Myte), is an electrical instrument of conventional design and construction, with magnetic receiver. Without switches, clips, etc., it measures 78 by 60 by 16 mm. Without batteries, ear piece or cord it weighs 65 gm. With batteries it weighs 97 gm. Like some other current models, it has no so-called tone control; the manufacturer states that five different magnetic receivers with different frequency response peaks are available. Evidence from sources acceptable to the Council indicated that this device was well constructed, performed as represented by the manufacturer, and satisfied the minimum requirements of the Council for the acceptance of hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Paravox Hearing Aid, Model J (Tiny-Myte), in its list of accepted devices.

(Tiny-Myte)

MICRONIC HEARING AID, STAR MODEL, ACCEPTED

Manufacturer: Micronic Company, 727 Atlantic Avenue, Boston 11.

The Micronic Hearing Aid, Star Model, is an electrical hearing aid with magnetic receiver and crystal microphone, conventional in arrangement, design and parts. Excluding hinges, switches, etc., it measures 81 by 45 by 18 mm. Without batteries, ear piece or cord it weighs 66 gm. With batteries it weighs 94 gm.

Evidence from sources acceptable to the Council indicated that this device was well constructed, performed as represented by the manufacturer, and satisfied the minimum requirements of the Council for acceptance of hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Micronic Hearing Aid, Star Model, in its list of accepted devices.

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RADIATION MYELITIS

During intensive x-ray therapy of structures close to the brain or spinal cord, sufficiently large amounts of radiation may be received by the brain or cord to produce serious damage.[1] That this complication occurs more frequently than is generally realized is indicated by several studies made in the last few years. Boden,[2] for example, found five fatal and five nonfatal cases of radiation myelitis of the cervical cord in a series of 161 patients who received x-ray therapy for malignant tumors of the nose, mouth, pharynx, or cervical lymph nodes. Because of the long latent period between the irradiation and the appearance of symptoms, the cause of the condition was often not recognized initially. Frequently, the patient, discharged by the radiologist during this interval, was seen by a physician who was unaware of the technic of irradiation or of its implications. Symptoms were usually ascribed, without proof, to metastases from the original tumor, and only at autopsy was the true nature of the lesion discovered. The initial symptoms in every case were numbness and tingling in the hands or feet precipitated by flexion or extension of the neck and often associated with pain in the neck and shoulders. In a few cases these symptoms were transient, disappearing in three to nine months. In the remainder the paresthesias were followed by weakness or spastic paralysis of one or more extremities and later by bowel or bladder dysfunction. In the fatal cases there was intercostal paralysis. Death resulted eventually from bronchopneumonia or ascending urinary tract infection. When the number of roentgens received incidentally by the cervical cord during the irradiation therapy of these patients was calculated from their records, it was discovered that most of them had received a higher dose than was intended. Sometimes this was due to overlapping of fields of irradiation from multiple portals and at other times to the physician's miscalculation of radiation factors or failure to elicit a history of previous irradiation to the neck for other purposes.

Subsequently Boden [3] reported seven cases of fatal radiation damage to the brain stem following x-ray therapy of malignant tumors of the middle ear, pharynx, or parotid gland. He found that this catastrophe occurred in the startling proportion of 25% of the patients treated by beam-directed techniques in which multiple small fields were centered on the tumor. The cranial nerve palsies, ataxia, and hemiplegias that appeared 11 to 40 months after irradiation in the older patients were usually attributed to cerebrovascular accidents until autopsy proved the error of this diagnosis. As a result of his dosage calculations in these two series of patients, Boden concluded that the limit of tolerance of the central nervous system is 3,500 to 4,500 r, depending on the size of the fields used. He warned that, with doses above this level, symptoms are likely to occur.

Prior to Boden's study Ahlbom [1b] observed four fatal cases of radiation myelitis of the cervical cord in a series of 235 cases of cancer of the hypopharynx treated with x-rays or radium, and Stevenson and Eckhardt [4] reported a fatal case in which the cervical cord received 6,000 to 8,000 r during intensive radiation therapy for lymphoepithelioma of the nasopharynx. Radiation myelitis of the thoracic portion of the spinal cord occurred in a patient reported by Smithers, Clarkson, and Strong,[5] who received a depth dose of 5,800 r in 39 days for carcinoma of the esophagus. Similar involvement of the lumbosacral segment of the cord was recorded by Greenfield and Stark [6] in three patients out of a series of 180 following irradiation of retroperitoneal nodes for carcinoma of the testis. The spinal cords of these patients received between 4,500 and 5,000 r.

In all these cases the delayed onset of the symptoms and the microscopic findings at autopsy suggested that the roentgen rays affected primarily the blood vessels rather than the neurones and that the eventual neurologic lesions were the result of gradual impairment of blood supply. This is in keeping with the concept that blood vessels are much more susceptible to radiation damage than is nerve tissue. The lesions of radiation myelitis can be distinguished clinically from those of metastases to the spine or cord by the absence of roentgenographic changes in the vertebrae and the absence of changes in the spinal fluid (with the exception of an occasional elevated protein level) in the former. Prevention of catastrophes of this kind, according to Boden, depends on the modification of radiotherapeutic techniques so that as far as is possible, radiation of the central nervous system is avoided. When it is necessary to irradiate tumors situated near the spinal cord or brain, the depth dose received by these structures should routinely be estimated and should be kept as low as possible, preferably below 3,500 to 4,500 r.

1. (*a*) Warren, S.: Effects of Radiation on Normal Tissues: IX. Effects on Nervous System, Arch. Path. **35**: 127 (Jan.) 1943. (*b*) Ahlbom, H. E.: Results of Radiotherapy of Hypopharyngeal Cancer at Radiumhemmet, Stockholm, 1930 to 1939, Acta radiol. **22**: 155, 1941.

2. Boden, G.: Radiation Myelitis of Cervical Spinal Cord, Brit. J. Radiol. **21**: 464 (Sept.) 1948.

3. Boden, G.: Radiation Myelitis of Brain-Stem, J. Fac. Radiologists **2**: 79 (July) 1950.

4. Stevenson, L. D., and Eckhardt, R. E.: Myelomalacia of Cervical Portion of Spinal Cord, Probably Result of Roentgen Therapy, Arch. Path. **39**: 109 (Feb.) 1945.

5. Smithers, D. W.; Clarkson, J. R., and Strong, J. A.: Roentgen Treatment of Cancer of Esophagus, Am. J. Roentgenol. **49**: 606 (May) 1943.

6. Greenfield, M. M., and Stark, F. M.: Post-Irradiation Neuropathy, Am. J. Roentgenol. **60**: 617 (Nov.) 1948.

SUBCLINICAL INFLUENZA

Confirmation of the current theory of subclinical infection is reported by Kalter [1] of State University, Syracuse, N. Y. This is based on a study of the development of influenzal antibodies in eight students engaged in research with influenza virus. Three stains of virus (PR8, Lee and Fm-1) were used in their investigations, which consisted in inoculations, harvesting and titrations of these strains over a period of three to four months. Hemagglutination-inhibition titers were taken of the serums of these eight students before this research was begun. Titers were also taken after two months of laboratory exposure and at the end of their work. Control titrations were made of the serums of 57 fellow students not engaged in this research.

The initial serum samples of all students had antibody titers varying from 40 to 640 units. The titers were highest against the Lee strain, presumably owing to a previous Syracuse influenza B epidemic. By the end of the test period, six of the eight students in the research group showed a fourfold to a thirtyfold increase in antibody titer against all three strains. The remaining two students of this group showed similar increases to but one or two of the three strains. There was no demonstrable antibody increase in the control group of 57 students. None of the test group had any clinical symptoms resembling influenza during the test period. The increased antibody titer was thus presumably due to subclinical or inapparent infection with one or more (usually all three) of the test viruses.

THERMAL GRADIENTS IN THE VASCULAR SYSTEM

Recent data on intracardiac and deep intravascular temperatures are of interest, since the mechanisms that normally maintain temperature within narrow limits are not yet well understood. Horvath, Rubin, and Foltz [1] measured the temperature in various blood vessels and tissues in the anesthetized dog by means of thermocouples fitted into plastic catheters and reported the presence of thermal gradients in the vascular tree, indicative of sites of increased heat production. Employing similar techniques, Eichna and his associates [2] measured the temperature in the right side of the heart, in the deep vessels leading to the right side of the heart, in the femoral artery, and in the rectum in 24 afebrile and five febrile hospitalized subjects. Temperatures in the right side of the heart, pulmonary artery, and femoral artery were found to be equal and consistently less than that in the rectum. In afebrile patients, the average difference between rectal temperature and that of the right side of the heart was 0.25 C.; in febrile patients differences as great as 0.8 C. were noted, the differences being greater in patients with higher fevers. The temperatures in the superior vena cava and in the femoral artery were approximately equal to those of the right atrium, while progressively lower temperatures were recorded as the thermocouple was moved from the right atrium into the superior vena cava and into the subclavian vein. On the other hand, the temperature rose as the thermocouple passed from the subclavian into the common jugular vein, and at the level of the jugular bulb it equaled the rectal temperature. The temperature of the hepatic vein blood also equaled that of the rectum.

Clinically, body temperature is usually determined by measurement of the temperature in the mouth, rectum, axilla, or groin. The studies of Horvath, of Eichna, and of Bazett [3] and their associates offer evidence of a complex pattern of local areas of heat production and heat loss within the body; hence a single temperature measurement gives an inadequate picture of the temperature in other parts of the body. If maintenance of thermal homeostasis depends on the temperature of the blood reaching the hypothetical temperature-regulating center in the hypothalamus, intracardiac and femoral arterial temperatures should be of considerable significance, since the temperature of the blood entering the critical tissue is more likely to be indicated by these temperatures than by any other measurement now available.

UTILIZATION OF NONSPECIFIC NITROGEN

It is well known that the rat will grow and maintain its nitrogen balance on rations whose nitrogen content is derived exclusively from mixtures of the so-called essential amino acids. The usual protein sources, on the other hand, are made up of about 20 different amino acids, and the eight amino acids which Rose found essential to maintain nitrogen balance in man compose only about 40 to 50 per cent of the protein.

It is of interest to determine whether the nonessential amino acids are necessary for the optimum utilization of the essential ones and, also, to what degree the essential amino acids can be replaced by nonspecific nitrogen donors. These problems were recently studied by Frost and Sandy,[1] using the method of repleting rats that had been on a protein-deficient diet, a procedure developed earlier by Cannon. These investigators had shown that there was poor repletion of rats fed a mixture of the essential amino acids minus arginine, but, if isonitrogenous diets were used in which one-fifth to one-third of the nitrogen was replaced by arginine, glutamic acid, ammonium acetate, or diammonium citrate, a marked increase in appetite and body weight of the animals occurred. More striking, the weight increase of these animals compared favorably with that of rats receiving protein of high biologic value. For the rat, this work would indicate that at least 20% of the total nitrogen should be in the form other than essential amino acids to promote maximum utilization by the tissues. The actual form of this extra nitrogen appears to be nonspecific, and any ammonium salt or nitrogenous substance that, in the process of metabolism, gives rise to ammonia can be used. Work of this type is of considerable interest, since such data are essential to the preparation of amino acid mixtures for intravenous alimentation which will provide most efficient utilization of the injected nitrogen.

1. Kalter, S. S., Proc. Soc. Exp. Biol. Med., **76**: 570 (Mar.) 1951.

1. Horvath, S. M.; Rubin, A., and Foltz, E. L.: Thermal Gradients in Vascular System, Am. J. Physiol. **161**: 316 (May 1) 1950.

2. Eichna, L. W.; Berger, A. R.; Rader, B., and Becker, W. H.: Comparison of Intracardiac and Intravascular Temperatures with Rectal Temperatures in Man, J. Clin. Invest. **30**: 353 (April) 1951.

3. Bazett, H. C.: Blood Temperature and Its Control, Am. J. M. Sc. **218**: 483 (Nov.) 1949.

1. Frost, D. V., and Sandy, H. R.: Utilization of Non-Specific Nitrogen Sources by the Adult Protein-Depleted Rat, J. Biol. Chem. **189**: 249, 1951.

ORGANIZATION SECTION

STUDENT A. M. A.

Russell F. Staudacher, formerly of Lansing, Mich., who joined the American Medical Association and its Council on Medical Service May 1, 1951, has been named to a new and dual capacity with the organization. On July 1, he assumed the duties of executive secretary for both the Student American Medical Association and the American Medical Education Foundation. Prior to his association with the American Medical Association, Mr. Staudacher served as Associate Public Relations Counsel for the Michigan State Medical Society for several years. He also acted as public relations consultant to the Lansing (Mich.) Board of Education.

Immediately after military service he worked for the St. Louis public relations counseling firm of Frank Block and Associates. A World War II veteran with nearly four years' service with the Air Force in the European Theater in public relations, Staudacher also served on the USAAF public relations staff assigned to the 1945 atomic bomb tests on Bikini Atoll. He entered the Reserve Corps in 1945 as a major. Mr. Staudacher graduated from Alma (Mich.) College with a bachelor of arts degree and life teacher's certificate. He is married and has one son.

MEDICAL EDUCATION AND HOSPITALS

From time to time correspondence received at American Medical Association headquarters offices will be reproduced with their replies when it is believed that this correspondence will be of general interest to the readers of THE JOURNAL.—ED.

QUESTION.—*A hospital has had an application for appointment to their intern staff from a graduate of a foreign medical school which is not on the Council's list. May this man be appointed without jeopardy to the hospital's approved status?*

ANSWER.—Yes. Graduates of foreign medical schools may be appointed at the discretion of the hospital without prejudicing the hospital's approval for intern training. Lacking adequate information regarding the professional training which these schools provide, however, the Council does not assume any responsibility for evaluation of the graduate's credentials.

QUESTION.—*A hospital has been approved by the Council as offering satisfactory training in general surgery in preparation for a residency in a surgical specialty. After having completed one year of training in this hospital, the resident decides he wants to qualify for examination in general surgery. Will he receive credit by the American Board of Surgery for the year of training he has had?*

ANSWER.—No. Programs of this type have been approved to provide facilities for training in general surgery for residents who are qualifying for examination by one or another of the surgical specialty boards; e. g., American Board of Urology. Training in general surgery of less than three years' duration is accepted by the American Board of Surgery only if the program is integrated with that of a hospital which is fully approved (*J. A. M. A.* **142**:1216 [April 15] 1950).

QUESTION.—*How many x-ray and fluoroscopic machines are there in the United States?*

ANSWER.—This office does not have information on the number of x-ray and fluoroscopic machines in the United States, but according to our records a total of 5,386 registered hospitals have x-ray departments. Many of these, of course, have several x-ray units for roentgenographic and fluoroscopic procedures, besides studies and low and high voltage x-ray therapy.

We have also been informed that the publishers of *Modern Medicine* (84 South 10 St., Minneapolis) made a study some time ago of x-ray facilities in the medical and hospital fields. Their report indicated that x-ray equipment was owned by 5,170 hospitals and 32,250 physicians in the United States.

QUESTION.—*What are the qualifications necessary for a hospital staff appointment?*

ANSWER.—In general, it is required that the medical staff of a hospital should be limited to graduates in medicine who are properly qualified by training, licensure and ethical standing and are proficient in the fields of practice to which they devote themselves.

It has been further stated, however, that hospital staff appointments should depend on the qualifications of physicians to render proper care to hospitalized patients, as judged by the professional staff of the hospital, and not on certification or special society membership. Qualifications, therefore, are directly related to the amount of training and experience that individual physicians have obtained in their respective fields.

STATE LEGISLATION

California

Bills Enacted.—H. R. 155, was adopted June 22, 1951. It provides for the creation of an Interim Committee on Public Health to, among other things, study and analyze all matters relating to or affecting **public health** including needed revision of any and all laws in any way bearing upon the subject. H. R. 194 was adopted June 22, 1951. It provides for the creation of an Interim Committee on Finance and Insurance to study, among other things, **voluntary plans of hospital and/or health insurance** or plans operating under provision of the law to protect persons from the high costs of sickness and accidents in the state and other unregulated plans purporting to operate under existing provisions of law, and the need for regulation under existing laws or the enactment of regulatory legislation. H. R. 195 was adopted June 22, 1951. It provides for the creation of an Interim Committee on Finance and Insurance to study and analyze all facts relating to the furnishing of **pre-paid medical, surgical, hospital and other related services,** especially by unlicensed, unregulated and non-professional persons and organizations. S. R. 187, was adopted June 23, 1951. It creates an Interim Committee on **Narcotics and Hypnotics** to ascertain, study and analyze all facts relating to narcotics and hypnotics including the operation, effect, administration, enforcement and needed revision of all laws bearing upon the subject of the committee's duties. S. R. 214, was adopted June 23, 1951. It creates an Interim Committee to study and analyze all facts relating to a **shortage of nurses.** S. 731, has become Chapter 1201 of the Laws of 1951. It amends the health and safety code by requiring hospitals to keep a record of the **administration of hypnotic drugs,** including the amount given, the type, the date, and the name and address of the person to whom administered. S. 820 has become Chapter 1149 of the Laws of 1951. It amends the law relating to **narcotics** by making it a felony to sell, give away or prepare for sale or administer any narcotic to a minor.

Pennsylvania

Bills Introduced.—H. 1449 proposes to amend the law relating to mental illness, mental defect, epilepsy and inebriety by defining the word **"qualified physician"** as including osteopath. H. 1497 proposes general amendments to the **mental health act.** H. 1510 relates to the supplying of **insulin to diabetic pupils** in the public schools. H. 1524 proposes an appropriation of five hundred thousand dollars ($500,000) to the Department of Health for a study of **alcoholism** and treatment and rehabilitation of alcoholics. S. 746 proposes to require water companies to **treat water with sodium fluoride** when the governing body of any city, borough, town or township has, by ordinance or resolution, determined that the water supply thereof should be so treated.

Texas

Bills Enacted.—H. C. R. 108, was adopted June 8, 1951. It resolves that the House go on record as requesting this Board of State Hospitals and Special Schools to take the necessary steps to meet the **minimum standards** required in order to qualify the said **Hospitals and Special Schools** operated by the State of Texas to the necessary standards for residency, intern and nurses training programs so that the patients of the said Hospitals and Special Schools be given the highest type of medical care and treatment possible. S. 290 was approved June 15. It amends the medical practice act by authorizing the issuance of **temporary licenses to practice medicine** which shall be in effect until the next regular meeting of the board of examiners. S. 291 was approved June 15, 1951. It amends the basic science act by permitting the issuance of **temporary licenses** to be effective until the next regular meeting of the board. S. 295 was approved June 15, 1951. It makes it unlawful to sell or deliver any **barbituric acid,** amphetamine and desoxyephedrine except by a pharmacist upon an original prescription of a physician, dentist, chiropodist or veterinarian.

This summary was prepared by the Bureau of Legal Medicine and Legislation.

MEDICAL NEWS

ARKANSAS

Rural Health Conference.—The rural health committee of the Arkansas Medical Society, with the assistance of the Farm Bureau Federation, the Arkansas Dental Association, the Council of Home Demonstration Agents, and the Extension Service of the University of Arkansas, is sponsoring a conference in Little Rock August 9-10. The purpose is to help the medical profession and the rural citizens to assess their individual responsibilities in the solution of Arkansas' rural health problem.

CALIFORNIA

Retiring Professors Honored.—Three retiring members of the faculty of the University of California School of Medicine, San Francisco, were honor guests at the banquet of the school's alumni association June 15. They are Dr. Edwin I. Bartlett, associate clinical professor of surgery and pathology; Dr. LeRoy H. Briggs, William Watt Kerr Clinical Professor of Medicine, and Dr. Howard C. Naffziger, professor of neurological surgery and chairman of the department.

Personals.—Dr. Jacob C. Geiger, director of public health, City and County of San Francisco, recently received the Honorary Knighthood of the Royal Order of Dannebrog.——Dr. Edwin E. Kerr, assistant in surgery, University of California Medical School, San Francisco, has been awarded the $250 Helmut William Fesca Prize for 1951 as a member of the resident staff of the division of surgery who has done outstanding work during the last year. The prize was established by various donors in memory of Dr. Helmut William Fesca, who died July 27, 1944.

FLORIDA

State Medical Election.—At the annual meeting of the Florida Medical Association in Hollywood, April 22-25, Dr. David R. Murphey Jr., Tampa, was installed as president. Elected officers include Dr. Robert B. McIver, Jacksonville, president-elect, and Dr. Samuel M. Day, Jacksonville, secretary-treasurer.

GEORGIA

Dr. Shanks Honored.—Dr. Edgar D. Shanks, who has practiced medicine in Atlanta for 25 years, was presented a silver service July 1 by more than 50 friends in appreciation of his "faithful and loyal service to medicine in Georgia." Dr. Shanks served 16 years as secretary-treasurer of the Medical Association of Georgia and as editor of the association's journal. He also has served on numerous committees of the Fulton County Medical Society and was elected to its presidency in 1935.

INDIANA

Narcotic Violation.—Dr. Joseph A. Wall, Wabash, pleaded guilty at South Bend to a violation of the federal narcotic law and on May 14 was sentenced to a term of three years. The sentence was suspended and he was placed on probation for a period of five years.

Rural Health Conference.—This conference will be held July 31 at Purdue University, Lafayette, under the sponsorship of the committee on rural health of the Indiana State Medical Association in cooperation with the Agricultural Extension Service of the university. Out-of-state speakers include Dr. Herman N. Bundesen, commissioner of health of Chicago; Dr. Josiah J. Moore, Chicago, member of the National Brucellosis Committee, who will speak on "The Nation and Brucellosis," and Dr. George F. Bond, Bat Cave, N. C., whose subject will be "Here's Health the American Way." There will be a panel discussion on brucellosis. In the afternoon Mr. Robert Yoho of the Indiana State Board of Health will be moderator for a panel discussion, "Using Your Community Health and Medical Services to the Best Advantage."

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

KENTUCKY

General Practitioners Elect Officers.—At a meeting of the Kentucky Academy of General Practice in Louisville June 3 Dr. Richard R. Slucher, Buechel, was installed as president; other officers are Dr. Joe M. Bush, Mt. Sterling, president-elect; Dr. Keith P. Smith, Corbin, vice president, and Dr. David G. Miller Jr., Morgantown, secretary-treasurer.

Personals.—Dr. Frank M. Gaines Jr., Louisville psychiatrist, has been appointed state director of hospitals and mental hygiene succeeding Dr. Addie M. Lyon, now superintendent of the Central State Hospital, Lakeland. Dr. Gaines formerly held the position of clinical director of Norton Psychiatric Clinic, Louisville.——Dr. Lucius E. Smith, Louisville, has resigned as executive secretary of the Kentucky Tuberculosis Association. Dr. Smith was paid tribute at a luncheon and a dinner in Louisville April 27.——Dr. Robert Lich Jr., head of the urology department, University of Louisville School of Medicine, has been named a member of the Society of Genito-Urinary Surgeons. He is the only Kentucky urologist ever admitted to this organization.

MASSACHUSETTS

University News.—Harvard University, Boston, has allocated two-thirds of the $300,000 Ford Foundation grant it received last October to its medical school for a five-year study of the physiological and psychological effects of adrenal hormones.

Award Alvarenga Prize.—On July 14 the College of Physicians of Philadelphia awarded the Alvarenga Prize for 1951 to Dr. George W. Thorn, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School, Boston, for his contributions on the role of the adrenal cortex in health and disease. The prize was established by the will of Pedro Francisco DaCosta Alvarenga of Lisbon, Portugal, an associate fellow of the college, to be awarded annually by the college on the anniversary of the death of the testator.

MINNESOTA

State Board Regulates Children's Camps.—Regulation of children's camps in Minnesota was made the responsibility of the state board of health by the 1951 state legislature. Every summer between 200 and 300 camps for children are conducted in Minnesota. Some are run by private individuals; others are operated as a public service by churches or by youth organizations. The Minnesota Camping Association, with membership representing many of the camps and youth organizations, was responsible for introduction of the new legislation. The state board of health is authorized to issue yearly free permits for the operation of children's camps, and these are already being issued. State department of health personnel will visit the camps annually and will inform the operators of any failure to protect the health or safety of children.

Dr. Bittner Wins Cancer Award.—John J. Bittner, Ph.D., director of the division of cancer biology of the University of Minnesota, is the first winner of the Comfort Crookshank Award for Cancer Research, an honor presented through the Middlesex Hospital Medical School in London, England. In September Dr. Bittner will go to London to receive the silver medal award and the monetary grant of 230 English pounds ($644) which goes with it. He will deliver a lecture on his cancer research at the medical school. The award, from funds donated by the late Bessie C. Crookshank, will be presented triennially to a scientist who has made valuable contributions to cancer research. Dr. Bittner is past president of the American Association for Cancer Re-

search and the winner of the 1950 medal of the American Cancer Society. He was a member of the Medical Teaching Mission to Austria in 1947, sponsored by the Unitarian Service Committee and the World Health Organization. In 1947 Dr. Bittner was the official United States delegate to the Fourth International Cancer Research Congress.

MISSOURI

Rehabilitation Institute Moves to New Quarters.—The Vocational Rehabilitation Institute, Kansas City, has moved to a three-story building recently acquired as its permanent home. The institute is operated by 17 social agencies. Its medical policies are under the direct control of the Jackson County Medical Society through the medium of a medical advisory committee. On the first floor are the curative workshops, speech department, recreational space, and a layout for the projected therapeutic pool. Physical therapy and occupational therapy departments are on the second floor. The enlarged quarters made possible the addition of the ceramics and printing departments. The National Foundation for Infantile Paralysis is extending its scope to include services at the institute.

NEW JERSEY

Personal.—Dr. Henry H. Kessler, medical director of the Kessler Institute for Rehabilitation, West Orange, recently received the Edward J. Ill Award for 1951 from the Academy of Medicine of Northern New Jersey.

Cancer Grant to Rutgers.—The Damon Runyon Memorial Fund for Cancer Research has made a grant of $20,000 to Rutgers University bureau of biological research, New Brunswick, to continue and expand its study of chemical controls for cancer. The fund has made two other grants to the bureau: $10,000 in 1949 toward chemo-therapeutic studies and $5,000 in 1950 for the study of carcinogens.

Award in Orthopedics.—The New Jersey Orthopaedic Society offers an award of $100, open to all residents and interns in the State of New Jersey, for the best paper on an orthopedic or closely related subject. The paper selected will be read by the author at the spring meeting of the society in 1952. Papers are to be submitted on or before Jan. 15, 1952, to the secretary, Dr. Philip Willner, 852 S. 11th St., Newark 6.

NEW YORK

Dr. Campbell Named Dean at Albany.—Dr. James A. Campbell, assistant professor of medicine at the University of Illinois College of Medicine, Chicago, has been appointed dean of Albany Medical College, effective Sept. 1. Dr. Robert S. Cunningham, dean since 1937, will be given new responsibilities as executive director of the Albany Medical Center Council, a position he has held since May 1950. Dr. Campbell, a graduate of Harvard Medical School, Boston, in 1943, was appointed in 1946 executive officer of the medical division of the clinical research section at the Army Chemical Center, Edgewood Arsenal, Md. In 1947 he was named Harvey Cushing Fellow at Johns Hopkins Hospital and Medical School in Baltimore. He joined the staff of Presbyterian Hospital, Chicago, as assistant attending physician in 1948. Last year he was appointed associate attending physician and is in charge of the clinical teaching of medicine there. Dr. Campbell is 33 years old.

New York City

Dr. Rabinoff to Direct Department.—Dr. Sophie Rabinoff, since 1947 associate professor in public health at New York Medical College, Flower and Fifth Avenue Hospitals, has been appointed professor and director of the department of public health and industrial medicine. She has been connected with the Department of Health of New York City since 1934.

Changes in Hospital Directors.—Dr. Christopher F. Terrence has been appointed director of Rochester State Hospital, and Dr. Richard V. Foster, director of Gowanda State Hospital, effective July 1. Dr. O. Arnold Kilpatrick, former director at Rochester, has been transferred to Hudson River State Hospital, and Dr. Charles Buckman, former director at Gowanda, has been promoted to assistant state commissioner of mental health.

Personals.—Dr. Morton L. Levin, director of the office of medical services in the state department of health, who has been on leave of absence for a year at American Medical Association headquarters in Chicago, directing the program of the Commission of Chronic Illness, has returned to the department.—— Dr. Walter Levy has been elected president of the Alumni Association, New York University College of Medicine, a unit of the New York University-Bellevue Medical Center.

NORTH CAROLINA

Critical Nursing Shortage.—Duke Hospital, Durham, may have to close some of its beds or turn away some patients unless the current nursing shortage can be met, according to F. Ross Porter, the superintendent. The shortage of nurses at Duke has reached "critical proportions," he said, mainly because the hospital is now admitting the largest number of bed patients in its 20-year history.

Annual Medical Symposium.—The fifth annual medical symposium sponsored by the New Hanover County Medical Society will be held at Wrightsville Beach August 24. Among the principal speakers will be:

Hans Selye, Montreal, Canada, Cortisone and Corticotrophin (ACTH).
Charles F. McKhann, Cleveland, Convulsive Disorders.
John Pemberton, Rochester, Minn., Carcinoma of the Thyroid.
Isaac S. Tassman, Philadelphia, Fundus Changes in Vascular Disorders.
Robert W. Johnson Jr., Baltimore, Arthritis.

Officers of the society are Dr. Elbert C. Anderson of Wilmington, president, and Dr. William F. Barefoot of Wilmington, secretary.

OHIO

Narcotic Violation.—Dr. Louis R. Effler, Toledo, pleaded *nolo contendre* in the United States District Court at Toledo to a violation of the federal narcotic law and on June 15 was fined $200 and costs.

Dr. Sherry Succeeds Dr. Mirsky.—Dr. Solomon Sherry, New York, has been appointed director of the May Institute for Medical Research of the Jewish Hospital Association and assistant professor of the department of internal medicine at the University of Cincinnati School of Medicine, succeeding Dr. I. Arthur Mirsky, who has been made professor of clinical science and professor of research psychiatry at the University of Pittsburgh School of Medicine. Dr. Sherry had been assistant professor of medicine at New York University College of Medicine and assistant visiting physician at Bellevue Hospital, New York. During World War II he served in the medical corps of the army as flight surgeon with the rank of major and was awarded the U. S. Army Typhus Commission Medal for work on typhus control in Bavaria.

PENNSYLVANIA

Society News.—The third annual meeting of the Pennsylvania Academy of General Practice was held in Bedford May 25-27. Among the speakers were Drs. Charles P. Bailey and William A. Jeffers, both from Philadelphia; Dr. Philip Thorek, Chicago, and Dr. Roger B. Scott, Cleveland. New officers elected were as follows: Dr. Benjamin Schneider, Danville, president; Dr. Harry K. Marcy Jr., Pottstown, vice president; Dr. Anthony T. Merski, Erie, president-elect, and Dr. Horace W. Eshbach, Drexel Hill, secretary-treasurer.——The annual meeting of the Reading Eye, Ear, Nose and Throat Society was held June 20 at the Reading Hospital in West Reading. Principal speakers included the following:

Ramon Castroviejo, New York, Modern Concepts in Glaucoma Surgery, and Methods and Techniques in Ocular Surgery.
Benjamin H. Shuster, Philadelphia, Cranial Nerves in Otolaryngology.
Charles H. La Clair Jr., Norristown, Pa., Spontaneous Intramaxillary Hemorrhage.

Officers elected for the ensuing year include Dr. Harold L. Strause, president; Dr. J. Van Dyke Quereau, president-elect; Dr. Philip R. Wiest, treasurer, and Dr. Benjamin F. Souders, secretary.

Philadelphia

Personals.—Dr. Chevalier Jackson, professor of laryngology and broncho-esophagoscopy at Temple University School of Medicine, is president of the Philadelphia Civic Opera Company. ——Dr. Charles L. Brown, dean of the Hahnemann College and Hospital of Philadelphia, has been appointed as chief consultant in internal medicine on the board of central office consultants of the Veterans Administration.

Fellowship in Ophthalmology.—A two-year fellowship in ophthalmology has been added to the list of postgraduate training opportunities of the Woman's Medical College. The fellowship is under the direction of Dr. Eunice LeBaron Stockwell. The program will be carried out in the Hospital of the Women's Medical College of Pennsylvania, the Woman's Hospital, Pennsylvania School for the Deaf, and the Childrens' Heart Hospital. The first fellow is Dr. Marilyn Rigg of Los Angeles.

Pittsburgh

Studies on Inheritance.—Dr. Ching Chun Li, newly appointed research fellow in biostatistics, will conduct studies on inheritance in relation to public health problems at the Graduate School of Public Health, University of Pittsburgh. Dr. Li was graduated from the University of Nanking, China, in 1936. From 1946 to 1950, after graduate work at Cornell, University of Chicago, Columbia University, and North Carolina State College, he was professor and head of the department of agronomy at the National Peking University in Peiping, China. He left this position when the Chinese Communist government forbade the teaching of the Mendelian principles of heredity because they are unacceptable to communist ideology. Dr. Li's return to this country was made possible through the efforts of the Genetics Society of America.

TENNESSEE

State Medical Election.—Dr. Ernest G. Kelly, Memphis, was installed as president of the Tennessee State Medical Association at its recent annual meeting. Officers elected include Dr. Daugh W. Smith, Nashville, president-elect; Dr. Charles C. Trabue IV, Nashville, speaker of the house, and Dr. Rudolph H. Kampmeier, Nashville, secretary-editor.

Dr. Overman Directs Laboratory.—Richard R. Overman, Ph.D., Knoxville, has been appointed director of the laboratory of clinical physiology at the University of Tennessee, Knoxville. This laboratory is a portion of the Institute of Clinical Investigation, which has recently been established as an adjunct of the Medical Units of the university and the John Gaston Hospital. The new laboratory is intended to perform basic physiological determinations on the hospital patients and to promote clinical research programs. Dr. Overman has been associate professor of physiology in the University of Tennessee School of Biological Sciences since 1948.

VIRGINIA

Personals.—Dr. Claude C. Coleman, professor of neurological surgery and chairman of the department of the Medical College of Virginia, Richmond, has resigned from his teaching duties after 42 years of service, but will continue to do consulting work at the college after his resignation becomes effective July 1. The honorary degree of doctor of science was conferred on Dr. Coleman at the commencement exercises June 5.——Dr. William R. Bond, Richmond, has been made director of clinical research for the A. H. Robins Co., Inc., of Richmond. He is a lecturer in physiology at the Medical College of Virginia.

Visiting Professor to African University.—Dr. Sydney W. Britton, professor of physiology, University of Virginia, Charlottesville, has been appointed visiting professor of endocrinology at the University of Nigeria and will leave for Africa in February, 1952. Announcement of the award of the visiting professorship was made by the Department of State under terms of the Fulbright Act. While in Africa Dr. Britton will continue his investigations on endocrine involvement in the maintenance of the upright position, using primates available in the region. He will be on leave of absence from the University of Virginia during the second semester and will retire at the end of the year after 24 years of service.

WEST VIRGINIA

Personals.—Dr. Thomas L. Harris, Parkersburg, a past president of the West Virginia State Medical Association, has been appointed to the board of governors of West Virginia University for a term ending June 30, 1960.——Dr. George F. Evans, Clarksburg, has been reappointed a member of the medical licensing board for the term ending June 30, 1956. He has been on the board since its creation by the legislature in 1949.——Dr. Delivan A. MacGregor, Wheeling, has been appointed a member of the state board of health for the unexpired term of Dr. Robert J. Reed, also of Wheeling, who resigned late in June. Dr. MacGregor's term will expire June 30, 1956.

Osteopathy a Limited Practice.—The attorney general of West Virginia on June 18 handed down an opinion that affects practice in West Virginia by osteopathic physicians and surgeons. In the opinion, which was written by T. D. Kauffelt, assistant attorney general, it was held that "osteopathic physicians and surgeons are entitled to the same rights and privileges as doctors of medicine in the treatment of cases only to the extent that their treatment remains within the field of osteopathy as defined by the legislature." The opinion ends with the statement that such treatment "is generally considered to exclude the administration of drugs and operative surgery." The matter was officially laid before the attorney general by Dr. Newman H. Dyer, state director of health, acting at the direction and on behalf of the state board of health and the medical licensing board. These two state agencies had previously been requested by the council of the West Virginia State Medical Association to seek an opinion from the attorney general concerning the legality of practice by osteopathic physicians of the same type of medicine and surgery now practiced by doctors of medicine.

GENERAL

Award in Otology.—Theodore H. Bast, Ph.D., of the University of Wisconsin Medical School, Madison, and Barry J. Anson, Ph.D., of Northwestern University Medical School, Chicago, received jointly the award of merit of the American Otological Society at its annual meeting in Atlantic City, N. J., May 12. Each received a silver medallion and a check for $500. Drs. Bast and Anson have been associated for many years in a special study of embryology and anatomy of the temporal bone and the ear. Much of their work, supported by the central bureau of the American Otological Society, has been summarized in a book "The Temporal Bone and the Ear," published in 1949. This is the society's second award for outstanding service in research in otology and in the interest of encouraging research on the problems of impaired hearing.

WHO Ships Mobile Health Units.—Three mobile health units, gifts from the World Health Organization to the governments of Jordan, Syria, and Lebanon, have been shipped from Alexandria, Egypt, to Beirut, Lebanon. The gift to Jordan is a $9,600 mobile dispensary built in Egypt on a bus chassis. The body contains a clinic and a laboratory as well as a dispensary. The unit will be used in desert and semidesert areas to carry medical and clinical services to remote places where no medical aid is available. The gifts to Syria and Lebanon are mobile public health education units. They contain posters, film projectors for outdoor showings, and public address systems with amplifiers and loudspeakers. On arrival in Beirut all three units will be handed over to the public health services concerned.

Committee Seeks More Exact Causes of Blindness.—The Committee on Statistics of the Blind at a recent meeting voted to make minor changes in the official classification of causes of blindness in order to obtain more complete statistics. It seeks more exact data on the number of premature infants becoming blind as a result of "retrolental fibroplasia," which has appeared only in the last few years, as well as more complete data on blindness from onchocerciasis and toxoplasmosis, parasitic diseases. The committee was first organized in 1930, and the classification on causes of blindness worked out by the group has since been adopted as standard throughout the world. Present members of the committee are Ralph G. Hurlin, Ph.D., New York, chairman, and Drs. Conrad Berens, Marta Fraenkel, and Raymond L. Pfeiffer of New York; Gabriel Farrell, D.D., Watertown, Mass.; Dr. Trygve Gundersen, Boston, and Dr. Carl E. Rice and Anne E. Geddes, Washington, D. C.

Art Association Awards.—Among the winners of the American Physicians Art Association exhibit held in Atlantic City, N. J., June 11-15 were Dr. Sol Fineman, New York, who won the Helser Cup for Yankee Ingenuity, and Dr. Richard H. Gwartney, San Bernardino, Calif., the Helser Second Cup. The Popularity Trophy was won by Dr. Leonard B. Fauguier, Jersey City, N. J. Thirteen first prizes were awarded in the advanced and beginners classes of media. Officers of the association for the coming year are Dr. Meyer M. Melicow, New York, president, and Dr. Francis H. Redewill, San Francisco, secretary-treasurer.

Cancer Mortality.—Encouraging indications of a decline in cancer mortality are reported by statisticians of the Metropolitan Life Insurance Company, who base their findings on the postwar experience of the company's millions of industrial policyholders. According to the report, for the accessible sites as a group, declines in the death rate for both men and women were recorded from 1946-47 to 1949-59, men by 2.4% and women by 7.2%. There was a reduction in female mortality from almost all the accessible specific types of cancer. In the case of the inaccessible sites as a whole, the death rate among women declined 1.1%, but, on the other hand, that among men showed an increase of 4%. However, both sexes showed decreases for such specific sites as the stomach, intestines, other digestive organs, bladder, and liver. Increases in death rates were recorded for cancer of the lungs and other respiratory areas.

Project in Weight Reduction.—Persuading the 25 million adult Americans who are overweight to lose their excess poundage through intelligent dieting under medical supervision has been made a major public health project by the Metropolitan Life Insurance Company. The purpose is to effect an improvement in general health by reducing the incidence of disorders most prevalent among overweight persons. Approval and active support of the nation-wide effort is being given by the American Heart Association, the American Diabetes Association, and the American Dietetic Association. One medium by which the campaign will be carried to the public is an eight-minute animated motion picture film for theater use entitled "Cheers for Chubby." The film will be offered without rental charge to theaters throughout the country. A key activity of the campaign will be the distribution of a booklet, "Overweight and Underweight." Copies of the free booklet will be available to the public at each of the offices of the Metropolitan.

Research Foundation Director Appointed.—The Research Foundation, Chicago, a private, non-profit organization formed to produce and distribute in this country the vaccine BCG, has appointed Mr. Philip G. Rettig, Chicago attorney, as executive director. Mr. Rettig has resigned as director of research and legislation for the National Society for Crippled Children and Adults to accept the new appointment. Under his direction the foundation will continue research for greater perfection of the vaccine, expand distribution, and pursue an intensified educational program. About 60 million persons throughout the world have been innoculated with the vaccine, it is reported. At present 136 institutions in this country are using it. Continuing basic research toward improvement of the vaccine is being carried on by the University of Illinois. Gaylord Donnelley, Chicago industrialist, is president of the foundation at 26 E. Huron St., which is licensed by the National Institutes of Health as the distributor of the vaccine.

Society Elections.—At the annual meeting of the American Dermatological Association in Hot Springs, Va., Dr. Edward A. Oliver, Chicago, was elected president; Dr. Fred M. Jacobs, Pittsburgh, vice president, and Dr. Louis Brunsting, Rochester, Minn., secretary.——Dr. Thomas L. Tolan, Milwaukee, was elected president of the American Hearing Society, Washington, D. C., by its board of directors in Chicago, July 1. He is the 13th person to head the society, which was founded in 1919 by the late Dr. Wendell C. Phillips. He succeeds Dr. C. Stewart Nash, Rochester, N. Y., who has served since November, 1944. ——Newly elected officers serving during 1951 for the Society for Pediatric Research include Dr. Horace L. Hodes, New York, president; Dr. F. Howell Wright, Chicago, vice president, and Dr. Sydney S. Gellis, Boston, secretary-treasurer.——Officers for the coming year for the Association of Surgeons of the Southern Railway System include Dr. Edward T. Newell Jr., Chattanooga, Tenn., president, and Dr. J. Marsh Frere Sr., Chattanooga, recording secretary.

American Board of Obstetrics and Gynecology.—The annual meeting of the American Board of Obstetrics and Gynecology was held in New York May 10-16, at which time 248 candidates were certified, including two single certifications in gynecology. Changes made at the meeting include adoption of the following:

1. Effective Jan. 1, 1952, case reports from one's residency service shall not be more than five (5) in number.
2. Exchange residencies into other specialties cannot be permitted to subtract from the minimal requirement of three (3) years of training divided between obstetrics and gynecology.
3. Application for re-examination in Part II must be made by the candidate prior to Feb. 1 of any year.
4. A blank logbook entitled "Medical Officer's Professional Training Record" is obtainable from the office of the surgeon general. This record should be carefully kept and attested while in military service. The next scheduled examination (Part I), consisting of a written examination and review of case histories, for all candidates will be held in various cities of the United States and Canada on Feb. 1, 1952. Application for examination or re-examination must be made by the candidate prior to Nov. 1, 1951.

Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6, was secretary of the board until his death on June 28.

American Leprosy Missions.—Sixty Protestant mission boards, operating through American Leprosy Missions, Inc., of 156 Fifth Ave., New York, will spend $535,917 this year on 148 colonies in 31 countries. The field covered by the missions takes in about 50,000 patients. Budgeting calls for the expenditure of $350,000 on food, clothing, and daily needs of resident patients plus salaries for doctors and superintendents; $170,000 for new hospitals, churches, schools, and homes, and $30,000 for drugs and medicines. The fund is to include $40,000 for three new colonies, one in the Belgian Congo and one in the Tanganyika region (both in Africa), and one in the Barrio Grande of Paraguay; $85,177 for 29 stations in India, and $33,400 for the Chiengmai colony in Thailand, the largest single unit. An emergency grant of $25,000 for China will be held in reserve "until political conditions permit the resumption of work in the colonies there." Asia as a whole will receive this year the benefit of $204,655, and Africa will receive $163,458. Other allocations cover $50,295 for South America, $5,828 for Europe, and $5,446 for North America. The American Leprosy Missions reported that only 2 or 3% of the estimated 10 million leprosy victims are receiving treatment in government or mission colonies.

Prevalence of Poliomyelitis.—The National Office of Vital Statistics reports that for the week ending July 7 a total of 407 cases of poliomyelitis was reported, which represents an increase of 19% over the previous week's figure of 341. For the same week last year, 478 cases were reported. The cumulative total since the seasonal low week is 2,026, as compared with 2,525 for the same period last year. No section of the country showed a marked increase in cases for the week as compared with the previous week.

Up to and including the week ended June 30, the incidence in Texas has been highest in Nueces and San Patricio counties, or about 30% of the cases reported in the state. Nearly half of the cases during this period occurred in Bexar, Harris, and Tarrant counties, all with large urban populations. In California there has been no great concentration of cases. In Louisiana 12 of the state's 30 cases during the week occurred in Shreveport. Prior to the first week of July, about one third of the cases were in the five counties in the extreme northwest part. In Oklahoma poliomyelitis cases were concentrated in Oklahoma and Garvin counties, and in Alabama nearly half the cases have been in Jefferson county.

States reporting more than 10 cases in the last two weeks are as follows:

	July 7, 1951	July 8, 1952		July 7, 1951	July 8, 1952
New York	17	29	Florida	10	8
New Jersey	5	16	Alabama	22	20
Illinois	16	19	Mississippi	17	8
Michigan	21	8	Tennessee	4	13
Wisconsin	12	6	Arkansas	15	13
Iowa	..	12	Louisiana	30	6
Nebraska	7	13	Oklahoma	21	26
Virginia	2	22	Texas	58	105
South Carolina	3	31	Colorado	21	..
Georgia	14	9	California	29	34

JUL 25 1951 MEDICINE STATE COLLEGE KANSAS

MEETINGS

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS, The Homestead, Hot Springs, Va., Sept. 6-8. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

AMERICAN CONGRESS OF PHYSICAL MEDICINE, Shirley-Savoy Hotel, Denver, Sept. 4-8. Dr. Walter J. Zeiter, 2020 E. 93d St., Cleveland 6, Executive Director.

MONTANA MEDICAL ASSOCIATION, Great Falls, Sept. 13-16. Mr. L. R. Hegland, 104 N. Broadway, Billings, Executive Secretary.

NATIONAL MEDICAL ASSOCIATION, Philadelphia, Aug. 20-24. Dr. John T. Givens, 1108 Church Street, Norfolk 10, Va., General Secretary.

NEVADA STATE MEDICAL ASSOCIATION, Riverside Hotel, Reno, Sept. 13-15. Dr. Wesley W. Hall, 307 W. Sixth St., Reno, Secretary.

POST GRADUATE MEDICAL ASSEMBLY OF SOUTH TEXAS, Shamrock Hotel, Houston, Texas, July 23-25. Mrs. W. H. Dahme, 229 Medical Arts Bldg., Houston, Executive Secretary.

RENO SURGICAL SOCIETY CONFERENCE, Riverside Hotel, Reno, Nev., Aug. 23-25. Dr. Olin C. Moulton, 130 N. Virginia St., Reno, Nev., Chairman.

ROCKY MOUNTAIN RADIOLOGICAL SOCIETY, Denver, Aug. 9-11. Dr. Maurice D. Frazer, 1037 Stuart Building, Lincoln, Nebr., Secretary.

U. S. CHAPTER, International College of Surgeons, Palmer House, Chicago, Sept. 10-14. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

UTAH STATE MEDICAL ASSOCIATION, Salt Lake City, Sept. 13-15. Dr. T. C. Weggeland, 42 S. Fifth East St., Salt Lake City, Secretary.

WASHINGTON STATE MEDICAL ASSOCIATION, Seattle, Sept. 9-12. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

INTERNATIONAL

ASSOCIATION INTERNATIONALE DE PSYCHOTECHNIQUE, Gothenburg, Sweden, July 24-28. Dr. Franziska Baumgarten-Tramer, Thunstrasse 35, Berne, Switzerland.

EUROPEAN CONGRESS ON RHEUMATISM, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edström, Sweden, Secretary.

GENERAL PRACTITIONERS STUDY CLUB INTERNATIONAL, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

INTERNATIONAL ASSOCIATION OF ALLERGISTS, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

INTERNATIONAL CONGRESS OF ANESTHESIOLOGY, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept 20-22. 12 rue de Seine, Paris 6e, France, Secretariat.

INTERNATIONAL CONGRESS ON ENTOMOLOGY, Amsterdam, Holland, Aug. 17-24. Dr. J. de Wilde, 136 Rapenburgerstraat, Amsterdam, Secretary.

INTERNATIONAL CONGRESS ON INDUSTRIAL MEDICINE, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Honorary Secretary.

INTERNATIONAL GERONTOLOGICAL CONGRESS, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

INTERNATIONAL POLIOMYELITIS CONGRESS, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

INTERNATIONAL SOCIETY OF SURGERY, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

PAN PACIFIC SURGICAL ASSOCIATION CONGRESS, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

STUDENTS' INTERNATIONAL CLINICAL CONGRESS, Leyden, Utrecht, Groningen and Amsterdam, Holland, July 10-28. N. A. M. Bergstein, Oude Gracht 143 bis, Utrecht, Holland, Secretary General.

WORLD CONFEDERATION FOR PHYSICIAL THERAPY, Copenhagen, Denmark, Sept. 7-8.

WORLD MEDICAL ASSOCIATION, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary-General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ARIZONA:* *Examination.* Phoenix, July 17-19. *Reciprocity.* Phoenix, July 21. Sec., Dr. J. H. Patterson, 316 W. McDowell Road, Phoenix.

CALIFORNIA: *Written.* San Francisco, Aug. 20-23. *Oral.* Los Angeles, August 18. *Oral and Clinical Examination for Foreign Medical School Graduates.* Los Angeles, August 19. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO:* *Reciprocity.* Denver, July 10. Sec., Dr. George H. Gillen, 831 Republic Bldg., Denver 2.

CONNECTICUT:* *Regular. Examination.* Hartford, July 10-11. Sec to the Board, Dr. Creighton Barker, 160 St. Ronan St., Hartford. *Homeopathic.* Derby, July 11-12. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 19. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

GEORGIA: Atlanta, June, August, Oct. 9-11. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John Y. Battenfield, Agana.

HAWAII: *Examination.* Honolulu, July 9-12. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, July 9-11. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

MAINE: Augusta, July 10-11. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: *Examination.* Boston, July 10-13. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston 33.

NEVADA:* Carson City, August 6. Sec., Dr. G. H. Ross, 112 North Curry St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 12-13. Sec., Dr. John Samuel Wheeler, Room 107 State House, Concord.

NEW MEXICO:* Santa Fe, Oct. 8-9. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

NORTH CAROLINA: *Reciprocity.* Morehead City, July 28. Sec., Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 4-7. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Examination.* Columbus, December. *Reciprocity.* Columbus, Aug. 14 and Oct. 2. Sec., H. M. Platter, 21 W. Broad St., Columbus 15.

OREGON:* *Examination.* Portland, July 5-7. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July 10-13. Acting Sec., Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

PUERTO RICO: *Examination.* Santurce, Sept. 4. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

RHODE ISLAND:* *Examination.* Providence, July 5-6. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Rapid City, July 17-18. Sec., Dr. Clarence E. Sherwood, 109 Center St., West, Madison.

TEXAS: * *Reciprocity.* Marlin, Aug. 5. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Ft. Worth.

UTAH: Salt Lake City, July 11-13. Asst. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

WASHINGTON:* Seattle, July 16-18. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

WEST VIRGINIA: Charleston, July 9-11. Sec. Dr N. H. Dyer, Capitol Bldg., Charleston 5.

WISCONSIN:* Milwaukee, July 10-12. Sec., Dr. C. A. Dawson, River Falls.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: Juneau, August. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

DISTRICT OF COLUMBIA: *Examination.* Washington. Oct. 22-23. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

IOWA: *Examination.* Des Moines, July 10. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MICHIGAN: Detroit and Ann Arbor, Oct. 12-13. *Examination.* Sec., Miss Eloise LeBeau, 501 W. Michigan Ave., Lansing 15.

MINNESOTA: *Examination.* Minneapolis, Oct. 2-3. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: *Examination.* Omaha, Oct. 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln 9.

NEVADA: *Examination.* Reno, July 3. Sec., Mr. Frank Richardson, University of Nevada, Reno.

OKLAHOMA: Oklahoma City, Sept. 14. Sec., Dr. Frank C. Gallaher, 813 Braniff Bldg., Portland 4.

OREGON: *Examination.* Portland, Sept. 8 and Dec. 1. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

RHODE ISLAND: *Examination.* Providence, August 8. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TENNESSEE: *Examination.* Memphis, July 5-6. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

TEXAS: *Examination.* Austin, October. Chief Clerk, Mr. B. H. Kirk, 306 Nalle Bldg., Austin.

WASHINGTON: *Examination.* Seattle, July 11-12. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

WISCONSIN: *Examination.* Madison, Sept. 22. Sec., Mr. W. H. Barber, Ripon College, Ripon.

* Basic Science Certificate required.

DEATHS

Lull, Clifford Bell ✠ Philadelphia; born in Scranton, Pa., Feb. 3, 1894; Jefferson Medical College of Philadelphia, 1915; clinical professor of obstetrics at his alma mater from 1941 to 1946; past president of the Philadelphia Obstetrical Society; fellow of the American College of Surgeons, International College of Surgeons, American Association of Obstetricians, Gynecologists and Abominal Surgeons and the Philadelphia College of Physicians; an associate examiner of the American Board of Obstetrics and Gynecology; chief of staff and director, division of obstetrics and gynecology, Philadelphia Lying-In Hospital; consulting gynecologist and obstetrician, Philadelphia General Hospital; author of "Management in Obstetric Complications" and co-author with Dr. Robert A. Hingson of "Control of Pain in Childbirth"; editor of "Clinical Obstetrics," now in the process of publication; a member of the editorial board of *Digest of Treatment;* died in Pennsylvania Hospital July 6, aged 57.

Decherd, George Michael Jr., ✠ Austin, Texas; born in Austin, Texas, Dec. 19, 1906; University of Minnesota Medical School, Minneapolis, 1930; professor of internal medicine at the University of Texas Medical Branch in Galveston and director of the student health service at the University of Texas, Austin; at one time on the faculty of Tulane University of Louisiana School of Medicine in New Orleans; specialist certified by the American Board of Internal Medicine; member of the American Heart Association, Central Society of Clinical Research, Society of Experimental Biology in Medicine, American Public Health Association, and the American Society of Clinical Investigation; fellow of the American College of Physicians; chief of staff, Brackenridge Hospital; visiting physician, St. David's and Seton hospitals; died March 5, aged 44, of chronic lymphatic leukemia.

Cotton, Albertus ✠ Baltimore; born in Marysville, Kan., Sept. 23, 1872; College of Physicians and Surgeons, Baltimore, 1896; professor emeritus of orthopedic surgery and roentgenology at the University of Maryland School of Medicine and College of Physicians and Surgeons; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Orthopaedic Surgery and the American Board of Radiology; fellow of the American College of Surgeons; member of the American Roentgen Ray Society and the American College of Radiology; chief, orthopedic service, Mercy Hospital; attending orthopedic surgeon, James Lawrence Kernan Hospital and Industrial School for Crippled Children; affiliated with University, Presbyterian Eye, Ear and Throat, and Sydenham hospitals; died in Mercy Hospital May 3, aged 78, of nephrosclerosis with uremia.

Martin, Edward Gillette ✠ Detroit; born Dec. 27, 1880; Detroit College of Medicine, 1904; emeritus professor of proctology at his alma mater, now known as the Wayne University College of Medicine; specialist certified by the American Board of Surgery and the American Board of Proctology, of which he had been one of the founders; member of the American Proctologic Society; fellow of the International College of Surgeons and the American College of Surgeons; served as president of the Wayne County Medical Society; proctologist, St. Mary's Hospital and Detroit Tuberculosis Sanatorium; consulting proctologist, Receiving, Harper, Grace, and Florence Crittenton hospitals in Detroit and the Highland Park General Hospital in Highland Park; an early editor of the *Detroit Medical News*; died in Harper Hospital May 11, aged 70, of coronary thrombosis.

Sutherland, Charles Goldie ✠ Rochester, Minn.; born in Hamilton, Ont., Canada, June 19, 1877; University of Toronto Faculty of Medicine, Toronto, Canada, 1907; during World War I was an acting major in the Royal Army Medical Corps; entered the Mayo Clinic as first assistant in roentgenology in October 1918 and was appointed consultant in the section of roentgenology in July, 1923; assistant professor of radiology at the Mayo Foundation, serving until July 1942, when he became a member of the emeritus staff; an Associate Fellow of the American Medical Association; member of the American College of Radiology and the Minnesota Radiological Society; an honorary member of the Canadian Radiological Society; specialist certified by the American Board of Radiology; died in Colonial Hospital May 4, aged 73.

Burnap, Willard Lathrop ✠ Fergus Falls, Minn.; born in Dover, N. H., Jan. 28, 1874; Rush Medical College, Chicago, 1901; past president of the Minnesota State Medical Association and councilor of the Eighth District; in 1944 awarded the distinguished service medal of the state association for his "professional accomplishments and for service to the profession in Minnesota"; member of the Radiological Society of North America; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association in 1926, 1927, 1928, and 1950; instrumental in the creation of the Northern Minnesota Medical Association in 1920, serving as its secretary, general manager, and president; affiliated with Wright Memorial Hospital; died May 9, aged 77, of brain tumor.

Haygood, Charles Wendell, Shawnee, Okla.; born in Hanley, Texas, Oct. 17, 1909; University of Oklahoma School of Medicine, Oklahoma City, 1935; member of the American Medical Association; passed assistant surgeon of the U. S. Public Health Service Reserve from 1942 to 1946; on the staff of the city health department of Oklahoma City; served in the Oklahoma State Health Department; came to Shawnee as director of the City-County Health Unit and served from 1940 to 1946; partner in the Keen-Haygood Clinic; on the staff of the City Hospital; business manager of the *Bulletin of the Pottawattomie County Medical Society;* died in St. Anthony's Hospital, Oklahoma City, May 8, aged 41, of hypernephroma.

Johnson, William Joshua, San Antonio, Texas; born in Cookville, Texas, Feb. 9, 1883; Fort Worth School of Medicine, Medical Department of Texas Christian University, 1907; member of the American Medical Association; fellow of the American Psychiatric Association; specialist certified by the American Board of Psychiatry and Neurology; served on the staff of the North Texas State Hospital, Terrell; at one time superintendent of the East Texas State Hospital for Insane in Rusk and the State Hospital for Senile Insane in Austin; for many years superintendent of the San Antonio State Hospital; died in Nix Memorial Hospital March 6, aged 68, of gastric hemorrhage and peptic ulcer.

Rafferty, Theodore Newell, Sebring, Fla.; born in Robinson, Ill., April 21, 1908; University of Illinois College of Medicine, Chicago, 1933; fellow of the American College of Physicians; member of the American College of Chest Physicians, National Tuberculosis Association, and the American Trudeau Society; served on the staffs of Maybury Sanatorium, Northville, Mich., Veterans Administration Hospital, New Orleans, and the Eastern North Carolina Tuberculosis Sanatorium in Wilson, N. C.; author of "Artificial Pneumothorax in Pulmonary Tuberculosis"; died in the Ochsner Foundation Hospital, New Orleans, April 8, aged 43, of subacute bacterial endocarditis.

Freeman, Benjamin Franklin, Grosse Pointe, Mich.; born in Waco, Texas, Nov. 18, 1896; Johns Hopkins University School of Medicine, Baltimore, 1922; member of the American Medical Association; fellow of the American College of Surgeons; served a residency at the City of Detroit Receiving Hospital; chief gynecologist at Saratoga General Hospital; member of the courtesy surgical staff, Highland Park General Hospital in Highland Park, and Harper Hospital, St. Joseph's Mercy Hospital, Woman's Hospital, and Grace Hospital, all in Detroit; died May 21, aged 54, of glioblastoma.

✠ Indicates Fellow of the American Medical Association.

Abbott, Charles E., Minden, Neb.; Western University Faculty of Medicine, London, Ont., Canada, 1902; member of the American Medical Association, died April 30, aged 74, of coronary thrombosis.

Allen, Martin Sylvester, Elizabethtown, Ky.; Kentucky School of Medicine, Louisville, 1885; formerly health officer of Hardin County; died April 17, aged 90, of pulmonary hemorrhage, arteriosclerosis, and hypertrophy of the prostate.

Armstrong, Edward Cornelius, Sussex, N. J.; University of the City of New York Medical Department, New York, 1889; died May 2, aged 87, of arteriosclerosis.

Baron, Samuel Lincoln, Philadelphia; Temple University School of Medicine, Philadelphia, 1910; an examining physician for the Army during World War I; on the staffs of Jewish and Mount Sinai hospitals; died May 3, aged 65, of myocarditis.

Baumeister, Charles F., Avoca, Iowa; Marion-Sims College of Medicine, St. Louis, 1897; past president of Pottawattomie County Medical Society; on the staff of Jennie Edmundson Hospital in Council Bluffs for many years; member of the American Medical Association; died in Bishop Clarkson Hospital, Omaha, Neb., May 4, aged 78, of carcinoma of the lung.

Bloemendaal, Edwin Gerald John, Lake Park, Minn.; State University of Iowa College of Medicine, Iowa City, 1936; member of the American Medical Association; died in St. Mary's Hospital, Detroit Lakes, April 1, aged 40, of subarachnoid hemorrhage.

Bowman, Fred Arnold ✦ Leon, Iowa; University of Louisville (Ky.) Medical Department, 1894; Keokuk Medical College, 1898; served as coroner of Decatur County, affiliated with Decatur County Hospital; died April 12, aged 79, of carcinoma of the prostate.

Boyce, Samuel George, Little Rock, Ark.; Western Eclectic College of Medicine and Surgery, Kansas City, Kan., 1909; served during World War I; died May 3, aged 63, of prostatic hypertrophy.

Bradley, John Martin ✦ St. Louis; Washington University School of Medicine, St. Louis, 1901; an Associate Fellow of the American Medical Association; died in De Paul Hospital May 3, aged 78, of cerebral hemorrhage.

Brigham, Jeanette M., Pasadena, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900; died in May, aged 76.

Britton, Roland L., Mays Landing, N. J.; College of Physicians and Surgeons, Baltimore, 1907; died March 1, aged 64, of coronary occlusion.

Bubna, Louis Edward, Cleveland; University of Rochester School of Medicine and Dentistry, Rochester, N. Y., 1932; served during World War II; on the staff of St. Alexis Hospital; physician for the Baltimore & Ohio Railroad; died May 2, aged 44, of a skull fracture received in a fall.

Buckman, Isaac, Doylestown, Pa.; Baltimore University School of Medicine, 1903; owner of a private hospital; died April 27, aged 74, of cerebral hemorrhage.

Burke, William Augustus, Brooklyn; Long Island College Hospital, Brooklyn, 1918; affiliated with Kings County, St. Peter's, and Holy Family hospitals; died May 9, aged 61.

Callerstrom, Gottfried William, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; member of the American Medical Association; formerly deputy county coroner; on the staff of the Swedish Hospital; died May 6, aged 69, of coronary occlusion.

Copenhaver, Meek Marion ✦ Knoxville, Tenn.; Tennessee Medical College, Knoxville, 1902; served during World War I; died May 3, aged 73, of coronary occlusion.

Cracroft, Thomas Byron, Asheville, N. C.; Medical Department of Tulane University of Louisiana, New Orleans, 1907; for many years affiliated with the Veterans Administration; died in Swannanoa May 5, aged 80, of lobar pneumonia.

Cutler, Franklin Earl, Wecoma Beach, Ore.; Cleveland Homeopathic Medical College, 1905; Jefferson Medical College of Philadelphia, 1906; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; died in the Good Samaritan Hospital, Portland, Ore., March 30, aged 72, of cerebral hemorrhage.

Ford, William, Williamsport, Pa.; Jefferson Medical College of Philadelphia, 1914; for many years medical examiner for the Pennsylvania Railroad; died April 25, aged 65, of coronary occlusion and diabetes mellitus.

Gardner, Russell Wilson ✦ Troy, Ohio; Ohio State University College of Medicine, Columbus, 1927; member of the American Society of Anesthesiologists; affiliated with Stouder Memorial Hospital; killed May 7, aged 53, in an automobile accident near Casper, Wyo.

Glenn, Robert Baltzell, Jacksonville, Fla.; University of Georgia School of Medicine, Augusta, 1941; member of the American Medical Association; served during World War II; died at sea, off Key West, April 25, aged 33, in an airplane accident.

Harned, John Wisdom, Hopkinsville, Ky.; University of Louisville Medical Department, 1897; member of the American Medical Association; on the staff of the Jennie Stuart Memorial Hospital; served on the local Selective Service Board during World War I and was reappointed during World War II; died April 22, aged 75, of dissecting aneurysm.

Henry, Frank Charles Jr. ✦ Perth Amboy, N. J.; Cornell University Medical College, New York, 1921; fellow of the American College of Surgeons; director of surgery, Perth Amboy General Hospital; assistant surgeon, Roosevelt Hospital, Metuchen; consulting surgeon, New Jersey State Hospital, Marlboro, and South Amboy Memorial Hospital, South Amboy; died March 7, aged 54, as the result of an automobile accident.

Hilliard, Hercules C., Paducah, Ky.; Eclectic Medical Institute, Cincinnati, 1900; died March 15, aged 75.

Hunter, Edwin William, Greenwood, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1901; died May 7, aged 81, of heart disease.

Irwin, Thaddeus Stevens, St. Petersburg, Fla.; Jefferson Medical College of Philadelphia, 1887; member of the American Medical Association and the Medical Society of the State of Pennsylvania; died April 12, aged 86, of arteriosclerosis.

Jorgenson, Milton Cyril ✦ Watertown, S. D.; Northwestern University Medical School, Chicago, 1930; died April 5, aged 46, of lymphosarcoma.

Kloepper, Victor Ferdinand ✦ St. Louis; Washington University School of Medicine, St. Louis, 1926; served during World War II; affiliated with Lutheran Hospital; died May 3, aged 50, of carcinoma of the pancreas.

Lander, William Tertius, Williamston, S. C.; Medical College of the State of South Carolina, Charleston, 1910; member of the American Medical Association and the American Trudeau Society; died May 15, aged 90, of heart disease.

Lawson, John Mack, Fort Worth, Texas; Baylor University College of Medicine, Dallas, 1934; member of the American Medical Association; fellow of the American College of Surgeons; on the staff of the Harris Memorial Methodist Hospital; died April 26, aged 41, of heart disease.

McAnerny, John Henry ✦ Parsons, Tenn.; University of Tennessee College of Medicine, Memphis, 1933; died May 4, aged 44.

Macbeth, Harry Francis, Seattle; Milwaukee Medical College, 1904; died May 3, aged 68, of cerebral hemorrhage and cerebral arteriosclerosis.

McNabb, John Wilson ✦ Louisa, Ky.; Medical College of Virginia, Richmond, 1923; served as president of the Lawrence County Medical Society; for many years president of the county board of health; died February 13, aged 55.

Martin, Robert Michael ✦ Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1910; affiliated with Grace, Michigan Mutual, and Children's hospitals; died in Harper Hospital April 20, aged 65, of carcinoma of the bladder.

Murtaugh, Edward G., Burlingame, Kan.; University Medical College of Kansas City, 1898; county coroner; formerly affiliated with the Indian Service; died April 7, aged 83, of cerebral hemorrhage.

Nicholson, Richard Eugene, Brenham, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1897; member of the American Medical Association; fellow of the American College of Surgeons; veteran of the Spanish-American War; chairman of the board of directors of Farmers National Bank; affiliated with Sarah B. Milroy Memorial Hospital; died February 7, aged 76, of cerebral hemorrhage.

Nowers, Walter E., Long Beach, Calif., John A. Creighton Medical College, Omaha, 1908; member of the American Medical Association and the Nebraska State Medical Association; died in Long Beach, April 17, aged 69, of myocardial infarction.

Oberholtzer, Edward James, Williamsfield, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; died in Cottage Hospital, Galesburg, May 2, aged 72, of cirrhosis of the liver and diabetes mellitus.

Ogle, Clairel Leroy ✦ Grants Pass, Ore.; Harvard Medical School, Boston, 1923; served during World War I; fellow of the American College of Surgeons; on the staff of Josephine General Hospital; died April 27, aged 57, of a compound fracture of the skull suffered in an automobile accident.

Owen, Albert Simpson, North Edgecomb, Maine; Tufts College Medical School, Boston, 1911; served with the army on the Mexican border in 1914; awarded the Croix de Guerre by the French government for his service during World War I; at one time a member of the board of education in Framingham, Mass., and on the staff of Bath Memorial Hospital in Bath; died May 4, aged 66, of coronary heart disease.

Paul, Samuel George, Salt Lake City; University of Pennsylvania Department of Medicine, Philadelphia, 1901; member of the American Medical Association; served as city health commissioner; for many years school physician; formerly chairman of the county board of health and police surgeon; affiliated with St. Mark's Hospital; died April 20, aged 74, of tuberculosis.

Pierce, Eben Douglas, Trempealeau, Wis.; University of Oregon Medical School, Portland, 1899; died May 3, aged 76, of carcinoma of the colon.

Price, Norman Wellington, Niagara Falls, N. Y.; University of Toronto Faculty of Medicine, Toronto, Canada, 1896; member of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of St. Mary's Hospital and Memorial Hospital, where he died April 18, aged 82, of myocardial infarction.

Quillian, Edgar Pierce, Clyattville, Ga.; St. Louis College of Physicians and Surgeons, 1899; member of the American Medical Association; died in Thomasville May 2, aged 73.

Rand, Morris ✦ Los Angeles; Baltimore Medical College, 1911; died April 8, aged 69.

Ray, Frank Leonard ✦ Charlotte, N. C.; Medical College of Virginia, Richmond, 1919; member of the American Medical Association; served during World War I; died April 23, aged 56, of arteriosclerotic heart disease.

Reed, Josiah Frederick, Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1918; past president of the Dauphin County Medical Society; fellow of the American College of Surgeons; served during World War I; died in Jackson Memorial Hospital, Miami, Fla., April 25, aged 60, of adenocarcinoma of the bladder.

Richardson, Everett Wesley, Winslow, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; died March 7, aged 73, of coronary thrombosis.

Robinson, Burton Lowry, Edna, Texas; University of Tennessee College of Medicine, Memphis, 1944; served during World War II; died in Meridian, Miss., May 4, aged 30, of cerebral hemorrhage.

Robinson, Dana E. ✦ Medical Director, U. S. Public Health Service, retired, Los Angeles; Medical College of Ohio, Cincinnati, 1896; died May 5, aged 76, of hypertensive heart disease and arteriosclerosis.

Roth, Jesse Henry, Tucson, Ariz.; University of Illinois College of Medicine, Chicago, 1915; specialist certified by the American Board of Otolaryngology; formerly practiced in Kankakee, Ill., and was past president of the Kankakee County Medical Society; formerly practiced in Jamestown, N. D., where he was on the staffs of Jamestown and Trinity hospitals; served during World Wars I and II; died May 1, aged 62.

Scarborough, James Warren, Terrell, Texas; St. Louis College of Physicians and Surgeons, 1917; member of the American Medical Association; for many years affiliated with Terrell State Hospital; died in Brackenridge Hospital, Austin, April 21, aged 76, of cardiac failure.

Schetky, Martha G. K., Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1897; died May 11, aged 81.

Schlosser, Charles Louis, Syracuse, N. Y.; Syracuse University College of Medicine, 1913; for many years medical examiner for the Metropolitan Life Insurance Company; died May 1, aged 70, of arteriosclerotic heart disease.

Sears, Clarence William, Youngstown, Ohio; State University of Iowa College of Medicine, Iowa City, 1932; member of the American Medical Association; served during World War II; died April 30, aged 44, of an accidental gunshot wound.

Shimer, Floyd Aaron, Phillipsburg, N. J.; Medico-Chirurgical College of Philadelphia, 1905; also a graduate in pharmacy; a trustee of Warren Hospital, where he died April 21, aged 70, of chronic nephritis and uremia.

Sibert, Aldo Vernon, West Palm Beach, Fla.; Ohio State University College of Medicine, Columbus, 1915; died April 24, aged 58, of heart disease.

Simkins, Raymond ✦ Bridgeton, N. J.; Jefferson Medical College of Philadelphia, 1915; an Associate Fellow of the American Medical Association; died April 24, aged 72, of coronary insufficiency and arteriosclerosis.

Smith, Festus Steely, Corbin, Ky.; Hospital College of Medicine, Louisville, 1905; member of the American Medical Association; owner of Smith Hospital; died in Fort Lauderdale, Fla., April 8, aged 71.

Stern, Hyman Bernard, Philadelphia; Medico-Chirurgical College of Philadelphia, 1908; died in Jewish Hospital April 13, aged 65, of cerebral hemorrhage.

Sweet, Austin Dryden, Martinsville, Ind.; Indiana University School of Medicine, Indianapolis, 1923; member of the American Medical Association; served during World War I; for two terms county coroner; died in the Veterans Administration Hospital, Indianapolis, April 22, aged 56.

Taussig, Joseph Bondi, St. Louis; Washington University School of Medicine, St. Louis, 1931; member of the American Medical Association; served during World War II; on the staffs of the Veterans Administration Hospital in Jefferson Barracks, Mo., and Jewish Hospital, where he died May 8, aged 46, of cerebral hemorrhage.

Willis, Benjamin Coleman ✦ Cincinnati; University of Virginia Department of Medicine, Charlottesville, 1902; affiliated with Christ Hospital; died April 15, aged 73, of heart disease.

Wilson, Homer Smith, Saugus, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1908; member of the American Medical Association; died May 1, aged 68.

Woods, Samuel D. E. ✦ Osawatomie, Kan.; Hahnemann Medical College of the Kansas City University, Kansas City, Mo., 1902; on the staff of State Hospital, where he had been superintendent for many years; died April 2, aged 73, of arteriosclerosis, diffuse pulmonary fibrosis and myocarditis.

GOVERNMENT SERVICES

DEPARTMENT OF DEFENSE

Appointments of Drs. Blake and Spencer.—Dr. Francis G. Blake, Sterling Professor of Medicine at Yale University School of Medicine, has been appointed scientific director, Medical Research and Development Board, Office of the Army Surgeon General. Dr. Blake recently resigned the chairmanship of the committee on medical sciences, Research and Development Board, Department of Defense. His new position is the most responsible civilian post in medical research in the Army. He will assist in planning and supervising the Army Medical Service research and development program, of which over 200 projects already are under way. On the Yale faculty since 1920, Dr. Blake was dean of medicine from 1940 to 1947. During World War II he served in a civilian capacity as consultant to the secretary of war and, beginning in 1941, for five years as a member of the board of investigation of epidemic diseases in the U. S. Army.

Dr. Thomas B. Spencer has been appointed executive director of the committee on medical sciences, Research and Development Board, Department of Defense, succeeding Dr. Joseph M. Pisani, who will become assistant dean and instructor in medicine of the State University Medical Center at New York City. Dr. Spencer has served as deputy executive director of the committee since Aug. 1, 1950. Prior to that he was in private practice in Rochester, N. Y., and held staff appointments at Strong Memorial Hospital, Genesee Hospital, and Rochester General Hospital. Since September, 1950, he has been an instructor in clinical medicine at George Washington University.

Dr. Albert Rives Shands Jr., surgeon-in-chief of the Alfred I. duPont Institute of Wilmington, Del., has been appointed a member of the Armed Forces Medical Policy Council succeeding Dr. W. Randolph Lovelace II, who has been appointed chairman of the Council.

VETERANS ADMINISTRATION

Physicians Wanted.—The Veterans Administration Hospital, Downey, Ill., has vacancies for several physicians in the 217-bed tuberculosis unit of the hospital, as well as for an internist in the general medical unit. Salaries for the positions are determined by the experience and qualifications of the applicant. The salary range for physicians in the department of medicine and surgery includes: junior grade, $5,000 per year; associate grade, $5,400 per year; full grade, $6,400 per year; intermediate grade, $7,600 per year; senior grade, $8,800 per year, and chief grade, $10,000 per year. An additional allowance of 25% of the base salary is given those having a rating of specialist as approved by an American specialty board. Determination of the appropriate grade for applicants will be made by thorough evaluation of qualifications by a professional standards board. Promotions are available after meeting length of service and other requirements of the Veterans Administration. In addition, physicians are granted 30 days vacation and 15 days sick leave each year. Applicants should write to the Veterans Administration Hospital, Downey, Ill. The hospital is 35 miles north of Chicago, and five miles south of Waukegan, Ill.

New Hospital Managers.—The Veterans Administration has announced the appointment of new managers for three of its hospitals. The new managers are Dr. Edward S. Post, for the hospital in Sheridan, Wyo.; Dr. George S. Littell, for the Dallas, Texas, hospital, and Dr. Morris C. Thomas, for the hospital soon to be completed in Madison, Wis. Dr. Post, formerly manager of the VA hospital in Fort Custer, Mich., has moved to Sheridan to replace Dr. Victor H. Bean, who has been transferred to the Alexandria, La., hospital. Dr. Littell replaces Dr. Frederick R. Eastland, who recently resigned. Dr. Thomas presently is manager of the Waukesha, Wis. hospital.

Appoint Two Consultants.—The Veterans Administration has announced the appointment of two physicians to fill long-time vacancies on the Board of Chief Consultants. They are Dr. Charles L. Brown of Philadelphia, head of the department of medicine at Temple University and Hahnemann Medical School, and Dr. Charles E. Kossmann, associate professor of medicine at New York University. Dr. Brown was appointed chief consultant in internal medicine, and Dr. Kossmann received his appointment for cardiology. Both men were selected from a list of specialists submitted by the Board of Chief Consultants at its recent meeting in Washington, D. C.

PUBLIC HEALTH SERVICE

Experimental Thyroid Cancers.—Harold P. Morris, biochemist at the National Cancer Institute of the Public Health Service, has been awarded the second prize in competition for the 1951 Van Meter prize awarded by the American Goiter Association. The award was made for a paper reporting that for the first time experimental cancers of the thyroid gland have been produced in animals. The cancers are transplantable to normal animals. The report is based on studies in progress at the institute for more than six years.

The first step in producing the experimental tumors is to block the secretion of the thyroid gland by adding a small amount of thiouracil to the animal's diet. The resultant thyroid deficiency causes an increase in the secretion of the hormone thyrotropin by the pituitary gland. Over-secretion of this hormone is thought to be accompanied by the under-secretion of other hormones, another unbalancing factor. Continuance of imbalance over a long period ends in malignancy. This tumor is thought to be caused by the prolonged stimulation of thyroid tissue by the thyrotropic hormone.

The discovery is a major advance in the laboratory attack on problems of thyroid cancer, according to Dr. John R. Heller, director of the National Cancer Institute. The possibility of a similarity between thyroid tumors in the mouse and those in humans, which was suggested by these experiments, has resulted in a new phase of thyroid tumor research at the National Cancer Institute. Exploratory studies in this field have found that some of the mouse thyroid tumors behave much like human thyroid tumors in that some have low ability to pick up radioactive iodine, and others show a high attraction for it. This finding makes possible studies to determine which factors influence the ability of thyroid tumors to concentrate administered radioactive iodine.

Venereal Disease Clinics.—The new Directory of Venereal Disease Clinics published by the U. S. Public Health Service carries summaries of prenatal and premarital laws, names and addresses of each diagnostic and treatment facility, and lists of laboratory facilities of each state, Marine hospitals, and facilities for American seamen.

There are 2,267 public venereal disease clinics in the United States and territories of Alaska, Hawaii, and Puerto Rico. North Carolina leads all other states, with 222 venereal disease clinics; Mississippi has 176; Georgia, 155; Pennsylvania, 139; Florida, 131; California, 118; Kentucky, 106; Texas, 101; South Carolina, 97, and Louisiana, 93. All other states have fewer than 90 clinics. These facilities were reported by the states and territories to the Public Health Service as of November, 1950.

The directory also shows that 42 states have prenatal laws requiring blood tests, and 41 states have premarital laws requiring blood tests and physical examinations for venereal disease. States not having prenatal laws are Alabama, Maryland, Minnesota, Mississippi, Tennessee, Wisconsin, and the District of Columbia. Arizona, Maryland, Minnesota, Mississippi, Nevada, New Mexico, Texas, and the District of Columbia do not have premarital laws. Alaska and Hawaii have both premarital and prenatal laws. Puerto Rico does not have either law, as such, but there is space on each "Certificado de Matrimonio" for a physician to state that applicants do not have mental disease, epilepsy, or syphilis.

FOREIGN LETTERS

LONDON

Royal Cancer Hospital Centenary.—The centenary of the Royal Cancer Hospital of London was celebrated on May 17, 1951. There was a reception at the hospital and demonstrations in the Chester Beatty Research Institute. At the centenary dinner, the chairman of the hospital board, Sir Edward Cripps, read a message from the King, congratulating the hospital on its great work during the hundred years of its existence and wishing it continued success.

Sir Henry Dale spoke of Dr. William Marsden, who founded the hospital at Hollywood Rd., West Brompton, after his wife died of cancer. It was later moved to its present site in Fulham Rd. It was the first hospital to deal solely with cancer. Sir Henry spoke of the lack of encouragement the hospital received in early days, as others did not altogether approve of a charitable hospital for one disease, but the founders persisted with their "courageous enterprise," their efforts being rewarded by a magnificent record for the hospital during the ensuing years. The speaker also thought it fit that the centenary of this hospital should fall in the Festival Year. Many scientific discoveries had been made since the 1851 exhibition; not all of them, unfortunately, had been used to further medical science, but there were many scientific advances made during the urgency of war which were subsequently adapted for human use.

Lord Horder, consulting physician to the hospital, speaking as the oldest member of the staff, recalled personalities of the past with whom he had been associated in his work. He pointed out the immense contributions to medical knowledge that had been made by special hospitals.

Mr. Oliver Lyttelton, president of the hospital, paid tribute to the work of the medical profession. He was glad that research institutions did not come under the control of the National Health Service, saying how essential it was that they should remain free of government control. With such control, there came inevitably a tendency to uniformity, followed closely by mediocrity. In no profession was uniformity more inappropriate than in medicine.

Mr. Hilary Marquand, Minister of Health, said the Royal Cancer Hospital was an institution of which the country and the commonwealth could be proud. Its change in ownership with the institution of the National Health Service brought no change in the purpose of the hospital's work. He was pleased that a film was being prepared to bring to public attention the dangers of cancer, the purpose of this film being to reassure, not to terrify, and to enable early diagnosis to be made. Cancer, he said, was the deadliest of foes and a challenge to all concerned in finding it, and the hospital could be proud of the hundred years spent in attempting to overcome the disease.

Demonstrations at the Chester Beatty Research Institute illustrated the contributions of various sciences to cancer research. In cytology, the effect of radiation and various chemicals on cell structures was shown. Methods of study of the cell by means of ultraviolet micrography and microspectography, phase-contrast micrography, cinemicrography, and electron micrography were exhibited.

There were other demonstrations, which included the preservation of chick tumor viruses by freeze-drying, electrophoretic diffusion studies, and biochemistry of tumors and of carcinogenetic and radiomimetric substances. There was also a historical section, illustrating the earlier experiments on carcinogenesis, and in the institute library many original papers were on display.

Burlington House.—It used to be the duty of one of the early members of the Royal Society to devise a new experiment each week for demonstration to the assembled fellows. Nearly three centuries have passed since then, and science has become infinitely more complicated and scientists "devilishly sophisticated." These facts are reported by the *British Medical Journal* of June 2, 1951, in an annotation about the Annual Evening Party *conversazione* held at Burlington House. The demonstration for this year consisted of about 30 exhibits conveyed in a straightforward manner and their inventors were at hand to explain their work in simple language. Several concerned the sea, one for instance showing how the deep sea floor can be bored for samples and analyzed to reveal a million years of the earth's history. Another took a series of flashlight photographs of the sea bottom at a depth of 150 ft. The annotation calls it a kind of marine census.

Other maritime exhibitions were contained in tanks, for example, hermit crabs in transparent shells, pink and greenish shrimps, long feathery worms, and a sleepy octopus. There was also a transparent, slowly turning wheel, containing sea water and many tiny shell fish. This apparatus was used for measuring swimming speeds and changes induced in them by the passage of day into night. One exhibit displayed the skulls of South African ape men, whose brows were ridged and whose massive jaws contained carious teeth. These were the skulls of men dead for a million years. There was also an impression in stone of the skin of a dinosaur. Some films were shown of snakes and the treatment of snake bite, and how spermatozoa and red cells may be kept at a temperature of 79 C. in the presence of glycerin.

This is a rare display even for London, showing as it does living animals and apparatus used on the very frontiers of research. Unfortunately, the *conversazione* was confined to fellows of the Royal Society and their guests. The *British Medical Journal* expresses regret that such demonstrations, having been shown at the Royal Society, cannot be made available to the general public and even brought to the country in the form of a traveling show. Appropriate ministerial departments, it is suggested, could well afford to finance such an undertaking. There is the continual risk that science should appear too remote and theoretical to the man in the street, but public experiments performed as they were in the day of Pepys can do much to further public knowledge of Science.

Barber-Surgeons.—In the *British Medical Journal* Supplement of June 2, 1951, Dr. A. K. P. Tobin says that the trade or profession of barber-surgeons, a flourishing one some two or three centuries ago, was put out of existence when the law forbade the practice of its more enterprising members of relieving their patients of varying quantities of blood, thus severing the connection between tonsorial and medical practitioners. The correspondent draws a present day analogy between these two forms of art. The barber, or hairdresser, charges 21 cents per head per haircut, and this operation can be repeated at a minimum of monthly intervals, thus giving the barber an annual capitation fee of $2.50 at least, as this does not include tips. The correspondent's hairdresser can average five haircuts an hour, thus controlling a panel of 1,000 clients, working 48 hours a week for a 50-week year. The family doctor, working 48 hours a week in a semirural area, cannot hope properly to look after more than 1,500 patients. The "looking after" includes night calls, unremunerated overtime and interrupted Sundays. Overhead expenses also are much heavier, and the responsibility, of course, is much greater.

The correspondent's conclusion is that, by balancing tips and quick sales, on the one hand, with maternity and special examination fees, on the other, the net incomes are similar in the two cases. He concludes with the pious hope that the Ministry of Health will not exploit too long the love of medical men and women for their calling.

Taking the Cure.—The *Lancet* of May 26, 1951, reports the findings of the British Medical Association Sponsor Committee, under the chairmanship of Lord Horder, on the place of the spa in modern practice. The report is in the form of a guide on all the spas in Great Britain, giving information with regard to the various forms of treatment at each spa. The committee is of the opinion that spa treatment can be of great value in chronic arthritis of rheumatoid and degenerative types. The rheumatism

The items in these letters are contributed by regular correspondents in the various foreign countries.

that affects muscles and fasciae and the fibrositic type generally can also be relieved. Other conditions believed by the committee to benefit by spa treatment are inflammation of the urinary tract and pelvic disorders in women. The committee believes that spas could play a greater part in the convalescent treatment of both surgical and medical patients.

The committee feels that the profession tends to underestimate the value of spas and fails to appreciate the progress made at these centers in recent years. Closer cooperation among spa hospitals, universities, and teaching hospitals would promote research and insure greater continuity of treatment, standardized investigations, and follow-up. If this cooperation came about, spa treatment would then take its proper place in the National Health Service.

DENMARK

Cortisone and ACTH.—The organ of the Danish Medical Association, *Ugeskrift for Laeger*, reviews the present position in Denmark with regard to cortisone and corticotrophin (ACTH). Remarkably good results have been achieved in cases of rheumatic fever, the temperature and swelling of the joints subsiding in a day or two and symptoms referable to the heart disappearing quickly. Diseases of the eye, such as iridocyclitis and keratitis, and diseases of the skin, such as malignant pemphigus, have responded dramatically, and it has been found that the local instillation of cortisone gives satisfactory results in diseases of the eye. The supply of cortisone being very limited, its use has hitherto been largely reserved for experimental work. The situation is better with regard to corticotrophin, which since the autumn of 1949 has been available from home sources. Denmark, being a great exporter of bacon, should be able to produce large quantities of corticotrophin from the pituitary glands of pigs, and the highly developed chemical industry should ultimately succeed in producing well-standardized preparations of corticotrophin. Meanwhile the supplies of cortisone and corticotrophin now available are so small that they cannot meet the needs of even a small fraction of the patients anxious to give them a trial. The number of those who have been able to derive benefit of many months' duration under prolonged treatment is still rather small.

Index Medicus Danicus.—Up to 1912, the University Library in Copenhagen collected Danish medical publications in typewritten sheets under the heading *Bibliotheca Medica Danica*. Between 1913 and 1927 a card index was kept of Danish medical publications under the heading *Index Medicus Danicus*. After 1928, Drachmann undertook the editing of this work, which he continued for 22 years, to the end of 1949, in card index form. Now this form, accurate but rather cumbersome, has been replaced by the printed word. Four numbers of this new publication are to appear every year, and the subscription for a year is 25 Danish crowns. The *Index* groups Danish medical publications under such headings as medicine, surgery, and pediatrics, and provision is made for cross references when, for example, a fibroma of the ovary comes under the headings of both tumors and gynecology. The output of Danish medical publications is now so great and their standard so high that this *Index* is certain to prove increasingly valuable.

Effects of Tonsillectomy on Children.—A follow-up study of children undergoing tonsillectomy has recently been undertaken by Dr. Boy Kromann and Dr. Preben Eilersen at a children's hospital (Dronning Louises Börnehospital) where this operation was performed on 450 children during the five-year period 1945-1949. The indications for tonsillectomy were (1) repeated attacks of acute febrile tonsillitis, (2) chronic tonsillitis with or without signs of dyspepsia, (3) tonsillitis associated with involvement of the kidneys, heart, or joints, as well as chorea, (4) presence of mechanical interference with speech, respiration, or swallowing, and (5) presence of conditions such as colic and enuresis which might be connected with recurrent tonsillitis. Mere hypertrophy of the tonsils was not an indication for tonsillectomy. Almost all the patients belonged to the first two categories. The dyspepsia in the second category usually took the form of recurrent attacks of malodorous diarrhea associated with anorexia and a poor general condition.

The follow-up study was undertaken three to 48 months after the operation, and care was taken to make a searching examination of the patients in the hospital. Altogether 217 children were examined after an average interval of about two years. The ages of these 217 children ranged from 2 to 15 years, and all of them had suffered from recurrent infections of the throat; 44 had also suffered from the dyspeptic symptoms already referred to. It was found that the catarrhal symptoms had vanished in 71% and the dyspeptic symptoms in 75% of the children. In no case had conditions grown worse since the operation. Dr. Kromann and Dr. Eilersen find tonsillectomy to be a useful remedy for dyspeptic disturbances combined with recurrent infections of the throat in childhood.

Food Poisoning Due to Bacillus Cereus.—In 1950 a veterinary surgeon, St. Hauge of Oslo, published a preliminary account of outbreaks of food poisoning due, in his opinion, to a hitherto overlooked germ, Bacillus cereus. His observations have lately been confirmed by his Danish colleagues O. Christiansen, Svend O. Koch, and P. Madelung, who report on an outbreak of food poisoning in a summer camp near Aarhus in Denmark. The symptoms were colic, nausea, and diarrhea without fever or any severe general disturbance. An investigation led to exoneration of the water and milk supply, and the peccant article of food proved to be a yellow pudding from which Bacillus cereus was isolated in pure culture. Most of the pudding had been prepared on the day before it was eaten, and it had been kept at temperature calculated to promote the growth of this organism. Fifteen of the 18 adults and 106 of the 130 children between the ages of 8 and 16 who had eaten this pudding fell ill. Pathogenic intestinal bacteria were not found in the feces. In the Norwegian outbreaks, also, stool examinations yielded little information.

TURKEY

Urinary Schistosomiasis.—When Syria and Iraq were part of the Turkish empire, many of the inhabitants of these provinces were treated for schistosomiasis in the government and municipal hospitals. The disease is rare in the present boundaries of Turkey. Isolated cases of schistosomiasis are occasionally seen in Istanbul, Ankara, and Izmir hospitals, but the disease has invariably been contracted in Syria, Iraq, or Saudi Arabia. In August, 1950, the Ministry of Health and Social Assistance appointed parasitologist and entomologist Dr. Mahmut Sabit Akalin, director of the School of Hygiene, Dr. Kemal Alpay, director of malaria control work of the Mardin region, and Dr. V. M. Yavuz Engin, of the Refik Saydam Institute of Hygiene, to make inquiries concerning schistosomiasis in the southern provinces of Mardin and Urfa, which border on Syria and Iraq. After conferring at the border with Dr. Rushdi Tarazi, director general of hygiene for Syria, and Dr. Abdel Halim Alemi, director of health at Damascus and chief of the Bilharzia division of the Ministry of Health, the mission concentrated on the villages along the Mardin-Nusaybin border and especially on the Tel-Abiad and Kubour El Bid Syrian regions; investigation revealed that 60 to 70% of the rural population were affected. Careful examination of hundreds of persons in Turkish villages revealed that a few cases of hematuria existed there; clinical and microscopic examination revealed the presence of Schistosoma hematobium. These patients formerly lived or visited in Syria and had contracted the disease there. Many brooks and streams that have their source in Turkish territory flow into Syria. Every kind of snail found in Turkish fresh waters has been examined; Schistosoma hematobium hosts, Bulinus contortus, were not found in these waters, though a great many were found in the same waters of the Syrian territory. The Sublag and Djerrahi brooks had many other kinds of mollusks. Bifid-tailed cercariae were found in the waters of Syrian territory but not in Turkish territory. Snails from both territories were left in experimental tubes with drinking water; the Syrian tubes later exhibited Bulinus contortus and Miracidia, which were absent in the Turkish tubes.

Dr. Abdel Azim Bey, director of rural hygiene at the Ministry of Public Health, Cairo, Egypt, who on behalf of the World Health Organization as expert consultant investigated schistosomiasis in the Middle East, confirmed that 60 to 70% of the inhabitants of the Tel-Abiad and Kubour El Bid regions were

infected with Schistosoma hematobium, that urinary schistosomiasis is endemic in the rural communities of southern Iraq around lake Khors and around the waters it receives, and that in northern Iraq isolated cases of schistosomiasis are encountered. Dr. Abdel Azim Bey pointed to the potential danger of the presence of fresh water snails in the rain water of swamps and streams in western Saudi Arabia in the regions of Taif, south of the holy city of Mecca. Schistosomiasis also exists among the workmen of the Saudi Arabian oil industry at the Persian gulf, where 22 of 25 school children examined were found to be infected. Investigation revealed that the disease is endemic in eastern Saudi Arabia, where the fresh waters harbor a great many snails.

Phytobezoar.—A phytobezoar was removed by Dr. Faruk Tuzener, chief at the surgical department of the Tokat government hospital. The patient was a 15 year old shepherd boy. He complained of a swollen abdomen, pain in the stomach, fainting, and epileptic fits. Six months before his admission to the hospital a doctor had administered santonin, and the patient passed 35 ascarides, which resulted in relief from pain for a month. Then the pain in the stomach, vomiting, and fainting recurred. The patient had a good appetite but was afraid to eat and lost weight. Significant findings at the time of admission were limited to the abdomen, which was greatly distended; a large, firm, mobile foreign body, with a rough surface and the size of a fist, was palpated. Generalized tenderness was present. The liver, spleen, and kidneys were in normal position. Exploratory laparotomy revealed a greatly distended stomach of normal color and maturity, with slightly thickened walls and a mobile mesogastrium. A firm, mobile foreign body in the stomach was palpated; gastrotomy was performed and a phytobezoar removed. It was oval and firm, weighed 320 gm., and consisted of a fermented mass of gray-green fiber and fruit rind.

THE PHILIPPINE ISLANDS

Physician Population.—There are about 6,900 physicians in the Philippine Islands, which has a population of 19,000,000. About one-third of the physicians reside in the capital, Manila, a city of over 1,000,000 population. The country has three schools of medicine, located in Manila; one is government owned, and the other two, including the well-known University of Santo Tomas, which was founded in 1619 by the Spaniards, are privately owned. A considerable number of the leading physicians here had their postgraduate training in universities in the United States.

Third Health Officers' Convention.—The third postwar Health Officers' Convention was held in Manila April 23-30, under the auspices of the bureau of health. The district health officers of some 53 provinces, 26 city health officers, and many physicians and dentists from all over the islands attended. The program included many refresher demonstrations in various medical activities, chiefly in the field of public health. Dr. Felipe Arenas, director of the bureau of health, and Dr. Mariano Icasiano, president of the League of District and City Health Officers, were the chief organizers. They received effective support from the secretary of health, Dr. Juan Salcedo Jr.

First South East Asia Medical Conference.—The first South East Asia Medical Conference was held simultaneously with the 44th Philippine Medical Association Convention. Dr. Abdul Kadir, delegate of Indonesia; Dr. Lim Uy Tao, from Nationalist China; Dr. Thongplensou, from Thailand; Dr. Francisco Roque, from the U. S. Public Health Service, and Dr. Carlos Ferrufino, delegate of the World Health Organization, Western Pacific Regional Office, attended this conference, which was organized by the Philippine Medical Association. Probably because of the economic and political instability in the majority of the Asiatic countries, many of them did not send delegates, therefore, this conference's achievements were limited. The Philippine delegate, explaining why this conference was called, said, among other things, "It is not safe to confine one's self solely to the medical problems of a country. . . . the medical problems now must be solved by countries of one geographical section. A sick man in Siam can be taken to Manila in a day, and a man with an infectious disease in Manila can be transferred to Djakarta in eight hours."

Thailand, the Philippines, and Indonesia were appointed members of a committee that will outline the plans for establishment of a South East Asia Medical Organization; the committee will consult the other countries and prepare for a convention at an early date. The World Health Organization delegate enthusiastically supported the establishment of such a medical organization and offered whatever facilities that W.H.O. might have for this purpose.

Forty-Fourth Annual Convention of the Philippine Medical Association.—Founded in 1903, the Philippine Medical Association had held its annual conventions regularly, except during World War II. The 44th convention was held May 1-6 at the University of Santo Tomas. Tuberculosis and malnutrition appeared to be the main public health problems of the Archipelago. Dr. Salcedo, director of the Institute of Nutrition and secretary of health, presented a sound plan for the fight against malnutrition. Dr. Rodolfo Gonzalez, the outgoing president of the Philippine Medical Association, emphasized the "vital problems facing medical education practice." In the closing General Session, Dr. Eugenio Alonso was installed as the new president.

BRAZIL

Nontuberculous Pulmonary Diseases and Incapacity to Work.—Drs. Durval Amorim, Ayrton Laroca, and Carlos Santos, of the Instituto dos Empregados em Transportes, an institution devoted to provide medical care, retirement, and pensions for the 135,000 workers of the transportation services of the state of São Paulo, published an analysis of the records of 2,000 successive medical examinations of applicants for compensation for incapacity to work, with special emphasis on nontuberculous pulmonary diseases. Of the 2,000 patients, 263 (13.16%) had diseases of the respiratory tract, distributed as follows: pulmonary tuberculosis, 156 (7.80% of the total); chronic bronchitis, 25 (1.25%); emphysema and pulmonary fibrosis, 24 (1.20%); bronchial asthma, 17 (0.85%); exudative pleuritis, 12 (0.60%); lobar pneumonia, 9 (0.45%); acute bronchitis, pneumonia, and bronchopneumonia, 7 (0.35%); pulmonary suppuration, 5 (0.25%); pulmonary blastomycosis and cancer, 2 each (0.10% each), and pneumoconiosis, bronchiectasis and spontaneous pneumothorax, 1 each (0.05% each). The incidence of tuberculosis (59.28%) is greater than that of any other disease of the respiratory apparatus. Chronic bronchitis, emphysema and pulmonary fibrosis, and bronchial asthma constitute the group known as chronic pneumopathies of nonspecific etiology. Chronic pulmonary diseases other than tuberculosis were present in 77 patients, or 3.85% of the total 2,000 cases and 29.24% of the cases of respiratory disease. Their incidence increases with the age of the persons in each group. Of 77 patients presenting nontuberculous chronic pulmonary diseases, only 21 returned to work, 19 of them within a year; most of them had asthma. Fifty-six retired or died within a year.

Turbidimetric Method for Determination of Small Amounts of DDT.—To control the results of mass house spraying with DDT by the National Malaria Service, a method was sought to measure accurately the small amounts of the insecticide remaining on the walls. The collection of specimens for analysis was done according to the process suggested by Alessandrini, i. e., scraping with a metal brush a surface of 25 sq. cm. Four colorimetric methods were tried (those of Alessandrini, Chaikin, Bayles and Payne, and Castillo and Stiff); all were rejected because of interference caused by the color pigments of the paints and by the emulsifiers used for the spraying. Kenk Kemp and Hilda A. Aguidar, of the Institute of Malariology, tried to adapt to microanalysis the Gunter-Neal turbidimetric method. The authors determined the amount of insecticide recovered from white, pink, gray, and yellow walls on which 1, 2, 3, and 4 mg. of DDT, respectively, had been sprayed; the respective amounts found were 1.00, 1.85, 2.99, and 3.90 mg. The method is easy to perform, without danger from the reagents, free of interference from the colored pigments of paints, and economical, since the alcohol utilized can be recovered by distillation.

CORRESPONDENCE

STREPTOCOCCUS ERYSIPELATIS NEEDED

To the Editor:—The Institute for Cancer Research urgently needs a virulent strain of Streptococcus erysipelatis isolated from an *untreated* case of erysipelas. It is recommended that any doctor willing to help us should obtain the organism by withdrawing the serum by hypodermic syringe from within the lesion and sow the material on an agar slant for shipment by air mail.

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Philadelphia 11.

SUICIDE FOLLOWING CORTISONE TREATMENT

To the Editor:—I have just perused the article "Suicide Following Cortisone Treatment" (*J. A. M. A.* **146:**337 [May 26] 1951). Certainly it is of value to have this case history of suicide coincident to cortisone therapy recorded in THE JOURNAL for all to see and be thus alerted to such possible hazard. However, a patient in a state of acute reactive depression with manifest suicidal inclinations should not be allowed to remain in her own home and under the surveillance and care of her family. It has been recognized for many years that any patient possessed of suicidal intent will succeed therein unless placed in an institution where means to such self-destruction do not exist and where the patient can be given constant and skilled attention.

Such acute suicidal psychoses occur widely and have been occurring long before modern drug therapy was discovered. The imperative need for commitment of such patients has long been known. Yet the recurrence of such preventable suicides in our communities, despite our vaunted progress in medical science, points to the utility and wisdom of again stressing the point that the doctor should insist on the immediate commitment of any patient who exhibits the least inclination to homicide or suicide.

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RESISTANCE TO PENICILLIN

To the Editor:—In two editorials in the April 21 issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, emphasis is directed to the emergence of penicillin-resistant bacterial strains, inferentially warning the medical world that ominous clinical problems may develop. In the *Archives of Surgery*, April, 1945, in a paper on "Topical Use of Concentrated Penicillin in Surface-Active Solution," and in THE JOURNAL of March 30, 1946, in another one on "Nonoperative Treatment of Osteomyelitis with Penicillin," a technique of multiple chemotherapy was described, with the use of an antibiotic (penicillin) and a detergent (aerosol OT), in which factors involved in the development of resistant strains were detailed, with attention directed to methods of controlling this problem.

It is urged that all physicians using antibiotics return promptly to the basic principle of microbiology controlling this phennomenon of resistance. That clinically better results may follow the wisdom of such fundamental therapy is obvious, as was noted in the September 1950 issue of *Surgery, Gynecology and Obstetrics* ("Modern Treatment of Chronic Osteomyelitis with Topical Detergent Antibiotic Therapy").

The medical profession, especially in this country, must become immediately mindful of the damage that is being done when resistant bacterial strains emerge, for we are producing and probably disseminating another type of infectious disease in which antibiotics may do infinite harm to the patient and not only impede his recovery but hasten his death.

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GENERAL PRACTICE

To the Editor:—Does the resurgence of the "general practitioner pose a threat to good surgical care? No! In a letter in, THE JOURNAL May 19, 1951, Dr. Edwin P. Lehman, director of the department of surgery at the University of Virginia, takes the opposite view of this question. There are many who would not agree with certain thoughts he has endeavored to develop, and it is only fair that these expressions be given voice.

No one interested in the revival of the "family doctor" has suggested that he be universally accorded surgical privilege. No one participating in the formulation of policy of the American Academy of General Practice has endeavored to support any person, member or nonmember, in his personal application for surgical appointment. However, we have endeavored to make it possible for the family doctor interested in surgery and desiring to improve himself in this field to have the opportunity for such advancement, to the same degree that he might anticipate it in other of the specialties. Certain principles have been put down in black and white whereby it is believed this can be assured without jeopardizing the proficiency of care that the patient may anticipate and, a step further, in setting up safeguards to insure a constant review and supervision of all surgical work done in order that laxity by any member of the staff may be discouraged and prevented.

Is there a scarcity of well-trained surgeons? We agree that surgical diagnosis is of paramount importance. We agree that preoperative and postoperative care is the most important element, other than diagnosis, in surgical care. Some workers do not possess mechanical ability and would never master a mechanical procedure. However, is surgical technique in itself so involved, so complicated, as to justify the awe in which the surgeon would be held? Is not his "one tract" approach to the treatment of disease a greater danger to the patient than a few added minutes on an operating table because of the surgeon's relatively lesser dexterity in tying a knot? Is it not true that at a recent sectional meeting of the American College of Surgeons an official of the college admitted that a medical audit of a hospital's records showed more unnecessary surgery was done by members of the board and the college than by a general practitioner enjoying surgical privilege? Is it not true that in many smaller communities general surgeons endeavored to treat conditions other than those purely surgical, and is it not true that their approach to such other disease would in all probability be much less adequate than would the general practitioner's approach to a surgical problem in which he had been found competent by his colleagues?

Dr. Lehman asked support for the program designed to increase interest in general practice and attract men to this field. Yet he, a general surgeon, would establish the limitation of the man in this field. Would he accept the general practitioner's limitations of his practice within the field of general surgery? Would he, for a minute, suggest to us in general practice that, if we accept his ideas regarding our limitations, we would then be left free and not subject to the limitations that would be imposed by the obstetrician, the pediatrician, the cardiologist, and members of other specialty groups?

General practice differs from the specialty fields primarily in the philosophy of the man engaged in it. The general practitioner is interested in the broad concept of medicine and is not concerned with the minutiae involved in the treatment of the rare or obscure case. That he will develop special interests and capabilities is understandable, but that he should decide what these will be and how they will be expressed is his right. That it is the responsibility of the medical profession, specialists and general practitioners, to evaluate honestly and without prejudice the professional work done in the community (which primarily concerns the hospital) is the real crux of the matter. It is necessary that the profession assume responsibility on the local level for the medical care rendered and find some means for controlling the practice of its members in all fields to guarantee that the work they perform will be done proficiently and that

no artificial standards or barriers will be imposed. Standards and procedures suggested by the A. A. G. P. give promise of success in this endeavor if given adequate fair trial.

We want more men in general practice—Dr. Lehman agrees. Hospital association is essential if the practitioner (specialist or family physician) is to keep himself abreast of current medical progress. Therefore, all doctors in the area should enjoy hospital appointment. The degree of activity of the individual physician in treating a patient in the hospital, be it medical, surgical, or obstetric, should be determined by ability as demonstrated, and not by any artificial prerequisite of training or special society membership. The general practitioner will not be content to serve as the "scut boy" and must be allowed additional hospital privilege in any of the specialty fields in which he demonstrates ability. His continued cooperation in the hospital program, the continuation of his education, his increased service to his patient, and his over-all development as a citizen in the community is dependent on his being offered the opportunity of advancement. No specialty group should be allowed to impose its ideas and prerequisites for membership on the group determining a man's staff privilege.

The growth of specialty boards did much to improve medical standards. However, they were built by those who had served conscientious preceptorships in obtaining the proficiency that made possible the training of specialists now in these boards. That one would revert to a program of trial and error in the training of doctors is unthinkable. However, that one should discard the proved value of the preceptorship plan of training is equally unthinkable. That long periods of prerequisite "in residency" training should be required of all doctors is an impossibility and actually not desirable. The American College of Surgeons has done a memorable job in its hospital standardization program. They have provided for special recognition of the man in a specialty field but have also insured opportunity for the man who is found capable through his innate ability and through proper application in the field to practice procedures within it. They have expressed themselves as being opposed to the closed staff principle in regard to surgery, as well as in general.

The implied tragedy lies in the threat to good medical and surgical care through failure of the members of the medical profession properly to supervise the work done in the hospitals and not in making it possible for proficiency and ability to be the determining factors in a man's hospital activity. Arbitrary rules regarding fixed periods of prerequisite training should not be accepted as a guarantee in these regards in any specialty field. A man who has completed a stipulated period of residency training should be and is more readily accorded privilege when he confines himself to the particular field of his training. Let us then encourage all men in medicine, wherever their special interest, to contribute their part to the better care of the patient, better preparation of themselves for the service they render, more unselfish interest in those they serve, and more time to the effort to improve the relationships among those within this great profession. Progress is the keynote. Let us not hastily cast aside proved means to this end; we should adapt them so that they will contribute in these days of rapid advancement in the profession.

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REFERENCES TO CLOTTING IN BIBLICAL LITERATURE

To the Editor:—On page 280 of THE JOURNAL for May 19, the writer of the interesting letter on "Biblical Allusions to Clotting" says there are no references to clotting phenomena in the New Testament. He has evidently overlooked John xix. 34: "One of the soldiers with a spear pierced his side, and forthwith came there out blood and water." The Lord had been dead for almost three hours, so that the fluid which the Apostle calls "water" must have been serum. The time given would have been ample for clotting to begin and for some blood to remain unclotted.

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ADIE'S SYNDROME

To the Editor:—Kern's article on Adie's syndrome in THE JOURNAL (Jan. 27, 1951) brings to mind the words of Martin Joseph Routh: "You will find it a very good practice always to verify your references, sir!" Kern's first two references are incorrect. The page Kern quotes for Strasburger's article, 1388, does not exist in that volume. The articles of Strasburger appeared in *Neurol. Centralbl.* **21:**738 and 1052, 1902, and those of Saenger in the same journal, **21:**837 and 1137, 1902. Oddly enough, in their article, Kennedy, Wortis, Reichard, and Fair quote Strasburger's article as being on exactly the same page, 1388. Kern writes: "The association of a tonic pupil and the absence of tendon reflexes was first described independently by Saenger and Strasburger in 1902." Strasburger preceded Saenger in describing the tonic pupil, but nowhere did either author mention its association with "the absence of tendon reflexes." After tonic pupil had been described, many writers mentioned its association with "the absence of tendon reflexes" but did this only casually. This association is usually called Adie's syndrome because of his work of 1931 and 1932. Historic justice, however, demands mention of the work done six years before Adie's publication, that of the Frenchmen Weill and Reys (*Rev. d'oto-neuro-ocul.* **4:**433 [June] 1926). To be historically correct, an eponym containing a half dozen names would have to be applied to this syndrome. If an eponym is to be used, it should be Weill-Reys. But all this confusion can be avoided when a physiologic name is used: "pseudotabetic pupilotonia." To the student this would mean more than any eponym.

It is time that something be done to prevent this epidemic of eponyms in neurological textbooks and literature. "Tuberculous spondylitis" tells the student more than "Pott's disease," "generalized neurofibromatosis" more than "von Recklinghausen's disease," and "finger flexor reflex" more than "Hoffmann, Troemner, Rossner, Bechterew, etc., reflex." We need more physiology and fewer eponyms.

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COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

UNIVERSITY OF OTTAWA FACULTY OF MEDICINE APPROVED

At its meeting on June 8, 1951, the Council on Medical Education and Hospitals voted to extend its approval to the University of Ottawa Faculty of Medicine, Ottawa, Canada. The action of the Council was based on a survey carried out by representatives of the Council and the Association of American Medical Colleges, April 2-6, 1951.

This medical school was established in 1945. The course of instruction extends over a period of six years, the first year being devoted to premedical studies and the last to a required internship. The first students were admitted to the first year class in the fall of 1945. The first sixth year class was enrolled in the fall of 1950 and graduated in May 1951.

In accordance with long-standing policy, approval is not granted any medical school until representatives of the Council survey the school after instruction has been instituted in all years of the medical course. The Council's approval, however, applies to all students in good standing at the school at the time it was officially inspected in April, 1951.

At its meeting on June 1, 1951, the Executive Council of the Association of American Medical Colleges voted to recommend to that association at its annual meeting in October, 1951, that the University of Ottawa Faculty of Medicine be admitted to affiliate membership in that association. This is the class of membership held by other Canadian medical colleges.

DONALD G. ANDERSON, M.D., *Secretary.*

MISCELLANY

THE UNITED STATES CHILDREN'S BUREAU

Prepared by Malcolm D. Lamborne Jr., of the A. M. A. Washington Office

The Children's Bureau is a federal agency authorized to advise parents on problems of child care and to help public and private agencies improve welfare and health services to children. The bureau's activities are particularly pertinent today because of legislative proposals that would give it authority to operate an Emergency Maternity and Infant Care (EMIC) program similar to the World War II plan, which paid for medical, nursing and hospital services for 1,454,000 maternity and infant cases of families of servicemen at a total of 125 million dollars.

The bureau's field of operations and budget have been steadily expanded. In 1912, the appropriation was $25,640 (all administrative) and the staff numbered 15. Now, the appropriation is approximately 32 million dollars, of which 95% is made up of grants to states, and the staff totals 260, including 17 physicians.

In the fiscal year ending June 30, the bureau received from Congress a total of $30,250,000 for grants of all types. Also available to states for grants were balances of $3,078,724 from previous years. The bureau's administrative budget for this year amounts to $1,500,000, including money for fact finding and reporting.

Miss Katharine F. Lenroot, bureau chief, estimates over three million pieces of literature, a great number of them bulletins for parents, were distributed in the past year. Some 26 million copies of *Infant Care*, first published in 1914 and revised seven times, have been sold or given away. It has been translated into six foreign languages, and is the Government Printing Office's all-time "best seller."

Miss Lenroot has been the bureau chief for 17 years. She reports to the Commissioner for Social Security who, in turn is responsible to the Federal Security Administrator. Miss Lenroot's office directs all bureau activities, formulates policies for the staff, cooperates with national and state commissions and organizations concerned with children and youth, and advises in planning for the White House Conferences on Children and Youth, which have been held approximately every 10 years since 1909. She is the U. S. member of the executive board of the United Nation's International Children's Emergency Fund.

ORGANIZATION

There are now six divisions operating under Miss Lenroot.

The *Division of Research* (Edward E. Schwartz, acting director) conducts research on physical, social, and emotional growth and development of children; develops standards growing out of research; conducts a clearing house for current research in child life; provides statistical service to the bureau, and prepares, in cooperation with the Division of Reports, bulletins on child care for parents. It has a staff of 46 and a budget for 1951 of $239,022.

The *Division of Reports* (Mary Taylor, director) publishes bulletins for professional and lay groups and a monthly periodical, *The Child;* designs exhibits for professional groups, and furnishes informational service to the press, magazines, radio, and other media. It has a staff of 23 and a budget of $247,826, including printing costs of bureau publications distributed free.

The *Division of Health Services* (Dr. Arthur J. Lesser, acting director) develops policies and recommendations for health services for mothers and children; administers grants to state agencies for maternal and child health services, for which $14,070,518 is available in fiscal 1951; administers grants to states for services for crippled children, for which $10,269,286 is available in the same period; provides advisory services for public and voluntary agencies on technical and administrative aspects of medical care and health services for mothers and children, and provides consultation to state agencies and private groups on pediatrics, obstetrics, orthopedics, cardiology, nursing, dentistry, hospital administration, physical therapy, medical social work, and nutrition. It has a staff of 80 and a budget of $494,058.

The *Division of Social Services* (Miss Mildred M. Arnold, director) develops policies for administration of grants and recommends standards of care of children by agencies furnishing social services to children in their own homes, in foster family homes, in institutions, and in juvenile courts, for which $8,988,920 is available for grants in fiscal 1951. It has a staff of 49 and a budget of $287,573.

The *Division of International Cooperation* (Miss Mary Larabee, acting director) cooperates with other countries in setting up and improving services for children under the Point IV (technical assistance) Program; provides consultation services to medical, nursing, nutrition, and social service agencies in other nations; develops training programs for professional people from other countries, and promotes international exchange of technical information on matters relating to child life. It has a staff of 9 and a budget of $71,700 from funds transferred by the State Department.

The *Division of Administrative Services* (Mrs. Laura E. Warren, director) plans and directs administrative activities essential to operation of the bureau; aids in drawing up budget and presenting it to Congress; maintains budgetary control over all bureau appropriations, and operates personnel and correspondence services. It has a staff of 42 and a budget of $146,298.

HISTORY

The Children's Bureau came into being April 9, 1912, with President Taft's signature on a bill sponsored by the late Senator William E. Borah and passed by the 62d Congress. The bill directed that the bureau shall "investigate and report upon all matters pertaining to the welfare of children and child life among all classes of our people, and shall especially investigate the questions of infant mortality, the birth rate, orphanages, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, legislation affecting children in the several states and territories."

Its formation is cited by child welfare leaders as an outgrowth of the first White House Conference on Children called in 1909 by President Theodore Roosevelt. The Bureau began in the Department of Commerce and Labor. In 1913, when separate departments were created, the bureau was made a part of the Labor Department and it remained there until its transfer, in 1946, to the Federal Security Agency. The year 1921 marked the beginning of a new emphasis and direction for the bureau. In that year, Congress passed the Federal Maternity and Infancy Act, popularly known as the Sheppard-Towner Act, which provided for grants to states (amounting then to $1,240,000) to assist in reducing maternal and infant mortality and for protecting the health of mothers and infants. Control of the program was vested in a Federal Board of Maternal and Infant Hygiene. The board was made up of the Children's Bureau chief, the Surgeon General of the Public Health Service, and the Commissioner of Education. It had authority to approve or reject state plans and to withhold federal funds from any state whose program was not operating as agreed on by the board and the state. During the life of the act, 45 states received grants. The Sheppard-Towner Act expired in 1929. The bureau for the next six years devoted itself exclusively to child research, fact finding and dissemination of information on child problems. With the passage in 1935 of the Social Security Act, the bureau returned to the field of state grants.

GRANTS

The Social Security Act provides for three Children's Bureau grant programs, which have continued in operation to the present time:

Maternal and Child Health Services.—Federal funds are distributed to state health departments, which use the money for the following purposes: salaries and training of professional

Another in a series of special studies toward better understanding of the operations of federal agencies.

no artificial standards or barriers will be imposed. Standards and procedures suggested by the A. A. G. P. give promise of success in this endeavor if given adequate fair trial.

We want more men in general practice—Dr. Lehman agrees. Hospital association is essential if the practitioner (specialist or family physician) is to keep himself abreast of current medical progress. Therefore, all doctors in the area should enjoy hospital appointment. The degree of activity of the individual physician in treating a patient in the hospital, be it medical, surgical, or obstetric, should be determined by ability as demonstrated, and not by any artificial prerequisite of training or special society membership. The general practitioner will not be content to serve as the "scut boy" and must be allowed additional hospital privilege in any of the specialty fields in which he demonstrates ability. His continued cooperation in the hospital program, the continuation of his education, his increased service to his patient, and his over-all development as a citizen in the community is dependent on his being offered the opportunity of advancement. No specialty group should be allowed to impose its ideas and prerequisites for membership on the group determining a man's staff privilege.

The growth of specialty boards did much to improve medical standards. However, they were built by those who had served conscientious preceptorships in obtaining the proficiency that made possible the training of specialists now in these boards. That one would revert to a program of trial and error in the training of doctors is unthinkable. However, that one should discard the proved value of the preceptorship plan of training is equally unthinkable. That long periods of prerequisite "in residency" training should be required of all doctors is an impossibility and actually not desirable. The American College of Surgeons has done a memorable job in its hospital standardization program. They have provided for special recognition of the man in a specialty field but have also insured opportunity for the man who is found capable through his innate ability and through proper application in the field to practice procedures within it. They have expressed themselves as being opposed to the closed staff principle in regard to surgery, as well as in general.

The implied tragedy lies in the threat to good medical and surgical care through failure of the members of the medical profession properly to supervise the work done in the hospitals and not in making it possible for proficiency and ability to be the determining factors in a man's hospital activity. Arbitrary rules regarding fixed periods of prerequisite training should not be accepted as a guarantee in these regards in any specialty field. A man who has completed a stipulated period of residency training should be and is more readily accorded privilege when he confines himself to the particular field of his training. Let us then encourage all men in medicine, wherever their special interest, to contribute their part to the better care of the patient, better preparation of themselves for the service they render, more unselfish interest in those they serve, and more time to the effort to improve the relationships among those within this great profession. Progress is the keynote. Let us not hastily cast aside proved means to this end; we should adapt them so that they will contribute in these days of rapid advancement in the profession.

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REFERENCES TO CLOTTING IN BIBLICAL LITERATURE

To the Editor:—On page 280 of THE JOURNAL for May 19, the writer of the interesting letter on "Biblical Allusions to Clotting" says there are no references to clotting phenomena in the New Testament. He has evidently overlooked John xix. 34: "One of the soldiers with a spear pierced his side, and forthwith came there out blood and water." The Lord had been dead for almost three hours, so that the fluid which the Apostle calls "water" must have been serum. The time given would have been ample for clotting to begin and for some blood to remain unclotted.

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ADIE'S SYNDROME

To the Editor:—Kern's article on Adie's syndrome in THE JOURNAL (Jan. 27, 1951) brings to mind the words of Martin Joseph Routh: "You will find it a very good practice always to verify your references, sir!" Kern's first two references are incorrect. The page Kern quotes for Strasburger's article, 1388, does not exist in that volume. The articles of Strasburger appeared in *Neurol. Centralbl.* **21**:738 and 1052, 1902, and those of Saenger in the same journal, **21**:837 and 1137, 1902. Oddly enough, in their article, Kennedy, Wortis, Reichard, and Fair quote Strasburger's article as being on exactly the same page, 1388. Kern writes: "The association of a tonic pupil and the absence of tendon reflexes was first described independently by Saenger and Strasburger in 1902." Strasburger preceded Saenger in describing the tonic pupil, but nowhere did either author mention its association with "the absence of tendon reflexes." After tonic pupil had been described, many writers mentioned its association with "the absence of tendon reflexes" but did this only casually. This association is usually called Adie's syndrome because of his work of 1931 and 1932. Historic justice, however, demands mention of the work done six years before Adie's publication, that of the Frenchmen Weill and Reys (*Rev. d'oto-neuro-ocul.* **4**:433 [June] 1926). To be historically correct, an eponym containing a half dozen names would have to be applied to this syndrome. If an eponym is to be used, it should be Weill-Reys. But all this confusion can be avoided when a physiologic name is used: "pseudotabetic pupilotonia." To the student this would mean more than any eponym.

It is time that something be done to prevent this epidemic of eponyms in neurological textbooks and literature. "Tuberculous spondylitis" tells the student more than "Pott's disease," "generalized neurofibromatosis" more than "von Recklinghausen's disease," and "finger flexor reflex" more than "Hoffmann, Troemner, Rossner, Bechterew, etc., reflex." We need more physiology and fewer eponyms.

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COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

UNIVERSITY OF OTTAWA FACULTY OF MEDICINE APPROVED

At its meeting on June 8, 1951, the Council on Medical Education and Hospitals voted to extend its approval to the University of Ottawa Faculty of Medicine, Ottawa, Canada. The action of the Council was based on a survey carried out by representatives of the Council and the Association of American Medical Colleges, April 2-6, 1951.

This medical school was established in 1945. The course of instruction extends over a period of six years, the first year being devoted to premedical studies and the last to a required internship. The first students were admitted to the first year class in the fall of 1945. The first sixth year class was enrolled in the fall of 1950 and graduated in May 1951.

In accordance with long-standing policy, approval is not granted any medical school until representatives of the Council survey the school after instruction has been instituted in all years of the medical course. The Council's approval, however, applies to all students in good standing at the school at the time it was officially inspected in April, 1951.

At its meeting on June 1, 1951, the Executive Council of the Association of American Medical Colleges voted to recommend to that association at its annual meeting in October, 1951, that the University of Ottawa Faculty of Medicine be admitted to affiliate membership in that association. This is the class of membership held by other Canadian medical colleges.

DONALD G. ANDERSON, M.D., *Secretary*.

MISCELLANY

THE UNITED STATES CHILDREN'S BUREAU

Prepared by Malcolm D. Lamborne Jr., of the A. M. A. Washington Office

The Children's Bureau is a federal agency authorized to advise parents on problems of child care and to help public and private agencies improve welfare and health services to children. The bureau's activities are particularly pertinent today because of legislative proposals that would give it authority to operate an Emergency Maternity and Infant Care (EMIC) program similar to the World War II plan, which paid for medical, nursing and hospital services for 1,454,000 maternity and infant cases of families of servicemen at a total of 125 million dollars.

The bureau's field of operations and budget have been steadily expanded. In 1912, the appropriation was $25,640 (all administrative) and the staff numbered 15. Now, the appropriation is approximately 32 million dollars, of which 95% is made up of grants to states, and the staff totals 260, including 17 physicians.

In the fiscal year ending June 30, the bureau received from Congress a total of $30,250,000 for grants of all types. Also available to states for grants were balances of $3,078,724 from previous years. The bureau's administrative budget for this year amounts to $1,500,000, including money for fact finding and reporting.

Miss Katharine F. Lenroot, bureau chief, estimates over three million pieces of literature, a great number of them bulletins for parents, were distributed in the past year. Some 26 million copies of *Infant Care,* first published in 1914 and revised seven times, have been sold or given away. It has been translated into six foreign languages, and is the Government Printing Office's all-time "best seller."

Miss Lenroot has been the bureau chief for 17 years. She reports to the Commissioner for Social Security who, in turn is responsible to the Federal Security Administrator. Miss Lenroot's office directs all bureau activities, formulates policies for the staff, cooperates with national and state commissions and organizations concerned with children and youth, and advises in planning for the White House Conferences on Children and Youth, which have been held approximately every 10 years since 1909. She is the U. S. member of the executive board of the United Nation's International Children's Emergency Fund.

ORGANIZATION

There are now six divisions operating under Miss Lenroot.

The *Division of Research* (Edward E. Schwartz, acting director) conducts research on physical, social, and emotional growth and development of children; develops standards growing out of research; conducts a clearing house for current research in child life; provides statistical service to the bureau, and prepares, in cooperation with the Division of Reports, bulletins on child care for parents. It has a staff of 46 and a budget for 1951 of $239,022.

The *Division of Reports* (Mary Taylor, director) publishes bulletins for professional and lay groups and a monthly periodical, *The Child;* designs exhibits for professional groups, and furnishes informational service to the press, magazines, radio, and other media. It has a staff of 23 and a budget of $247,826, including printing costs of bureau publications distributed free.

The *Division of Health Services* (Dr. Arthur J. Lesser, acting director) develops policies and recommendations for health services for mothers and children; administers grants to state agencies for maternal and child health services, for which $14,070,518 is available in fiscal 1951; administers grants to states for services for crippled children, for which $10,269,286 is available in the same period; provides advisory services for public and voluntary agencies on technical and administrative aspects of medical care and health services for mothers and children, and provides consultation to state agencies and private groups on pediatrics, obstetrics, orthopedics, cardiology, nursing, dentistry, hospital administration, physical therapy, medical social work, and nutrition. It has a staff of 80 and a budget of $494,058.

The *Division of Social Services* (Miss Mildred M. Arnold, director) develops policies for administration of grants and recommends standards of care of children by agencies furnishing social services to children in their own homes, in foster family homes, in institutions, and in juvenile courts, for which $8,988,920 is available for grants in fiscal 1951. It has a staff of 49 and a budget of $287,573.

The *Division of International Cooperation* (Miss Mary Larabee, acting director) cooperates with other countries in setting up and improving services for children under the Point IV (technical assistance) Program; provides consultation services to medical, nursing, nutrition, and social service agencies in other nations; develops training programs for professional people from other countries, and promotes international exchange of technical information on matters relating to child life. It has a staff of 9 and a budget of $71,700 from funds transferred by the State Department.

The *Division of Administrative Services* (Mrs. Laura E. Warren, director) plans and directs administrative activities essential to operation of the bureau; aids in drawing up budget and presenting it to Congress; maintains budgetary control over all bureau appropriations, and operates personnel and correspondence services. It has a staff of 42 and a budget of $146,298.

HISTORY

The Children's Bureau came into being April 9, 1912, with President Taft's signature on a bill sponsored by the late Senator William E. Borah and passed by the 62d Congress. The bill directed that the bureau shall "investigate and report upon all matters pertaining to the welfare of children and child life among all classes of our people, and shall especially investigate the questions of infant mortality, the birth rate, orphanages, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, legislation affecting children in the several states and territories."

Its formation is cited by child welfare leaders as an outgrowth of the first White House Conference on Children called in 1909 by President Theodore Roosevelt. The Bureau began in the Department of Commerce and Labor. In 1913, when separate departments were created, the bureau was made a part of the Labor Department and it remained there until its transfer, in 1946, to the Federal Security Agency. The year 1921 marked the beginning of a new emphasis and direction for the bureau. In that year, Congress passed the Federal Maternity and Infancy Act, popularly known as the Sheppard-Towner Act, which provided for grants to states (amounting then to $1,240,000) to assist in reducing maternal and infant mortality and for protecting the health of mothers and infants. Control of the program was vested in a Federal Board of Maternal and Infant Hygiene. The board was made up of the Children's Bureau chief, the Surgeon General of the Public Health Service, and the Commissioner of Education. It had authority to approve or reject state plans and to withhold federal funds from any state whose program was not operating as agreed on by the board and the state. During the life of the act, 45 states received grants. The Sheppard-Towner Act expired in 1929. The bureau for the next six years devoted itself exclusively to child research, fact finding and dissemination of information on child problems. With the passage in 1935 of the Social Security Act, the bureau returned to the field of state grants.

GRANTS

The Social Security Act provides for three Children's Bureau grant programs, which have continued in operation to the present time:

Maternal and Child Health Services.—Federal funds are distributed to state health departments, which use the money for the following purposes: salaries and training of professional

Another in a series of special studies toward better understanding of the operations of federal agencies.

personnel to conduct prenatal and postnatal clinics, well-child conferences, home and school visits by public health nurses, immunization services, medical and dental services for school-age children and other services. Including balances from previous years, there is available this fiscal year government funds of $14,070,518 for maternal and child health services. States must match half of the federal grants. The amount of federal money made available to each state is determined by a formula based on (1) the number of live births in the state in relation to total live births in the United States, (2) the state's financial need for help in providing services as indicated by per capita income, and (3) the number of live births in rural areas. Under this program, the bureau estimates that some 700,000 infants and preschool children attend well-child clinics annually, doctors make more than 2,300,000 examinations of school children, more than 170,000 expectant mothers attend medical conferences during pregnancy, and more than 1,500,000 children are immunized against smallpox and diphtheria.

Crippled Children Services.—Through state crippled children's agencies, federal funds help pay the cost of diagnosis and of medical, hospital, and convalescent care for children with crippling conditions. This year's funds for grants, including balances from previous years, amount to $10,269,286. In this program, too, states are required to match half of the grants. The amount of federal money a state may obtain is determined by a formula based on (1) the number of persons in the state under 21 years, (2) the state's financial need in carrying out its program as indicated by its per capita income, and (3) the number of persons under 21 in rural areas. Over 200,000 crippled children annually receive some kind of professional service, according to the bureau.

Child Welfare Services.—Through state welfare departments, federal funds help to support a wide range of social welfare services by paying a part or all of the salaries of trained child welfare workers for children who are neglected, orphaned, or delinquent. Some funds are used to pay for the actual care of children in foster homes. Federal funds including previous balances amount this year to $8,988,920. A state's share of grants is determined by the proportion of its rural youth under 18 years to the total rural child population. No fixed amount of matching funds is required for child welfare services grants, although each state must assume some of the cost. The bureau reports that more than 230,000 children annually receive services.

FEDERAL SUPERVISION

To qualify for funds in any of the three programs, state agencies must present plans which in the judgment of the bureau meet the requirements of the Social Security Act and assure a "good quality of service." State agencies are required to report their expenditures to the bureau at the end of each year.

All state plans are subject to approval or rejection by the bureau chief under power delegated by the Federal Security Administrator. This is in contrast to the Sheppard-Towner Act's tripartite board, which had final authority. Before funds are withheld, a state agency must be notified and opportunity for hearing given by the Federal Security Administrator. There is no provision for court appeal.

THE FUTURE

Dr. Edwin F. Daily, retiring chief of the Division of Health Services, who recently reviewed infant and maternity care progress of the last 15 years, reported a decrease of more than 80% in maternal mortality, a decline of almost 45% in infant mortality after the first few weeks, and an increase of almost 100% in the proportion of hospital deliveries. Just how much these gains may be attributed to the bureau's efforts and how much to progress in medical sciences cannot be accurately assessed. Miss Lenroot believes that federal officials should look toward new areas of activity. She emphasizes that, if civil defense or mobilization brings major family dislocations, then "new or expanded services for children will make a large claim on our public and private pocketbooks." One of these services might be another EMIC program.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Malpractice: Failure of Physician to Perform Caesarean Section When Requested by Patient.—The plaintiff sued for damages resulting from the alleged negligence of the defendant in postponing, contrary to her request, the performance of a Caesarean section. From a judgment in favor of the plaintiff, the defendant physician appealed to the court of civil appeals of Texas.

The plaintiff arranged for the defendant physician to attend her at the birth of her child which was expected to occur about two months later. She was then thirty-two years of age and had previously given birth to two children in another state, one in November, 1941, which lived only seven and a half hours and the other in November, 1942, which is a normal, healthy child. Plaintiff gave the defendant a complete history of her prior experiences and related many statements made to her by the doctors and nurses who attended her during the previous deliveries. She entered the Santa Rosa Hospital in San Antonio on the evening of November 12, 1947. Her labor, as in her prior experiences, was not steady or strong, and she was given "pitocin" which was intended to increase labor. She would have pains for a limited time and then quit, and she was taken to the delivery room in the hospital several times, but labor was not sufficiently strong or advanced to bring about the birth of the child. On the morning of the sixteenth, she was taken to the delivery room and placed under an anesthetic, was returned to her room until about 8:00 p. m. on the same date and was then again taken to the delivery room. The plaintiff introduced in evidence a statement which was signed by the defendant and entered in the hospital records showing what happened during the evening of November 16. That statement was as follows: "Patient was given a general anesthesia. Examination was made which showed that this baby's head was high. Forceps were considered, but it was decided that it would not be practical to apply forceps to the head as high as it was. Due to the fact that the patient had been in labor four days and the patient had adequate room it was thought best to do a version extraction. A deep ether anesthesia was given and hand placed up into the uterus. A very strong Bandl's ring was encountered, which would not relax even in extreme anesthesia. Nevertheless, an attempt was made to reverse the baby. Despite repeated attempts and despite the fact that the foot was drawn down to the head, the baby could not be diversed from a vertex position. In doing this the cord was found to be wrapped around the baby's neck. This became loosened and the cord prolapsed. This was divided between the head and the bony parts of the pelvis, which cut the baby's blood supply off. It was then decided to do a Caesarean section. Plaintiff was brought to the operating room still under anesthesia and transfusion was started."

It is definitely settled in Texas, said the court, that a patient has no cause of action against his doctor for malpractice, either in diagnosis or recognized treatment, unless he proves by a doctor of the same school of practice as the defendant (1) that the diagnosis or treatment complained of was such as to constitute negligence and (2) that it was the proximate cause of the patient's injuries. In order to prove that the defendant was guilty of actionable negligence in failing to deliver the child by Caesarean section on the morning of November 16 and in delaying such operation until the evening of the same date, it was necessary for plaintiff to show by competent admissible evidence that such failure and delay constituted a breach of the legal duty which the defendant owed to his patient of exercising ordinary skill and care in his professional efforts properly to deliver the child. Expert medical evidence was essential to such proof because the matter of determining whether to use forceps in the delivery of the child or to do a version extraction, or to do a

Caesarean section and when or under what circumstances, if at all, a reasonably skilful physician and surgeon would or should have resorted to any or all of these various alternatives, involved a practice of a highly specialized art and a learned profession with respect to which no layman could have any personal knowledge or experience on which the court might rely for guidance. Therefore, proper, expert medical evidence was a necessary element in, and an essential part of, the proof required of the plaintiff in order to show negligence and proximate cause.

The defendant, called as a witness by the plaintiff, was the only medical expert witness who testified in the case. He was interrogated fully and in detail under direct and cross-examination as to what he did in the diagnosis and treatment of the plaintiff and as to why he followed the course of procedure which he described. He did not testify to any fact or facts which in our opinion, said the court, showed or tended to show that he was guilty of negligence in failing to perform a Caesarean section sooner than he did. On the contrary, we think his testimony as a whole completely exonerated him of these charges. He testified that no doctor had the right to perform a Caesarean operation unless the facts in the case indicated that such operation was necessary and that he and his professional associates and consultants thought the plaintiff could have the baby normally until the evening of the sixteenth, when the operation was performed. The following questions and answers are typical of his testimony as a whole: "Q. During the course of your treatment of this woman did she ask you to take the child by Caesarean? A. Many times. Q. Why didn't you do it? A. Because I thought my judgment was better than hers." If in fact the defendant was using his best judgment in the diagnosis and treatment of his patient and if in good faith he was exercising that degree of skill and ability which constitutes good practice according to the standard of the medical profession in San Antonio and vicinity, said the court, then as a matter of law he was not guilty of malpractice or negligence and was not legally liable to plaintiff for damages flowing from bad results, if any, of his diagnosis or treatment.

The plaintiff testified that she wanted the child delivered by Caesarean operation and that she requested the defendant repeatedly, from November 14, to perform such operation. This testimony, said the court, must have been the basis upon which the jury made its findings of negligence. However, even though the plaintiff and her relatives wanted the operation to be performed sooner than it was, we do not think, the court concluded, that such desire on their part, irrespective of the reasons or motives which might have prompted the same, was sufficient to form the basis for a legal inference of negligence on the part of the defendant in failing to perform the operation sooner than he did. After due consideration of all the competent admissible evidence in the case, the court, therefore, concluded that such evidence was wholly insufficient to sustain the findings of the jury with respect to actionable negligence on the part of the defendant in failing to deliver the child by Caesarean birth on the morning of November 16 or in delaying the Caesarean operation until the evening of that day.

Accordingly the judgment in favor of the plaintiff was reversed and the cause was remanded to the trial court with instructions to enter judgment for the defendant physician.—*Christian v. Galutia,* 236 S.W. (2d) 177 (Texas, 1951).

Malpractice: Application of Doctrine of Res Ipsa Loquitur.—The plaintiff filed suit for damages for x-ray burns alleged to have been caused by the negligence of the defendant physician in administering treatments for papillomae. From a judgment in favor of defendant physician, the plaintiff appealed to the district court of appeal, second district, division two, California.

Prior to consulting the defendant for relief, the plaintiff was suffering from papillomae on the ball of each foot. The affliction had caused her considerable pain and had not responded to other treatments. The defendant administered x-ray therapy to her on three occasions at weekly intervals commencing Feb. 6, 1947. The relationship of physician and patient terminated about six weeks after the last treatment. At that time, according to the plaintiff, those portions of the soles to which x-rays had been applied were deep red at the center, pink in the circumference of the circle and it was all tender. In July, the area treated started to granulate. To use the words of the plaintiff, it "had the appearance of crystalized fruit," and from that time sloughing of the tissue continued and thereafter small blisters developed over the injured areas and over the dorsum of each foot. In February, 1948, the plaintiff was attended by a chiropodist who testified that the ball of each foot over a circle one inch and a quarter in diameter was denuded and that there was a colorless exudate from the area such as is seen in burns. The condition did not respond to treatment by the chiropodist and the plaintiff was unable to pursue her ordinary occupation from May until October, 1948. Thereafter she received treatment from a dermatologist and the lesions on the bottom of her foot healed leaving scar tissue over the sites of the lesions which the plaintiff testified were sore and which apparently did not have the same amount of tissue underneath the surface as the balance of the area of her sole. The defendant and the plaintiff both testified that the x-rays were administered by placing a metal tube with an opening at the outer end three-fourths inch in diameter against the bottom of the foot at the site of the papilloma. The balance of the foot, according to the defendant, was shielded by a sheath of lead, although the plaintiff had no recollection of the use of the lead shield.

The plaintiff first contended that the evidence was sufficient to warrant submitting the issue to the jury under the doctrine of res ipsa loquitur. The application of res ipsa loquitur, said the court, is necessarily limited in the field of malpractice. The courts have applied it in only a restricted class of cases where the layman is able to say as a matter of common knowledge and observation that the consequences of professional treatment were not such as ordinarily would have followed if due care had been exercised. It cannot be said, as a matter of common knowledge, that the condition which the plaintiff described which included blisters and sores on the soles and tops of her feet and on her shins was caused by the negligence of the defendant. In the absence of expert medical testimony the inference that the condition was proximately caused either by a change in the original condition suffered by the plaintiff or by some new trouble having nothing to do with the radiation was just as reasonable. Under such circumstances, said the court, the res ipsa loquitur doctrine is not applicable.

The plaintiff also urged a reversal on the grounds that the court erred in refusing to permit a chiropodist to testify that in his opinion the injury was an x-ray burn. The record showed that the chiropodist was a graduate of a school of chiropody, that he was licensed in California to treat diseases of the feet and thereby permitted to use x-ray treatments; that he had had courses in anatomy, physiology, histology, bacteriology, physiotherapy and x-ray; that he had spent four and a half years in the Navy attached to an x-ray department of a hospital; that he had studied dermatology and skin conditions. However, it was also shown that the witness had not studied the use of x-rays for treatment; had never in his practice administered x-ray treatments therapeutically; only once had he ever had occasion to distinguish between skin conditions arising from x-ray burns and those resulting from the direct application of heat which was in 1935; he had never treated such a burn; had seen only two cases of x-ray burns in forty years of practice; his use of x-ray in the Navy was for diagnostic purposes only, the therapeutic work having been performed by another department. There was no evidence introduced of any private study on the subject through attendance at lectures, reading or by contact with other men in the field. It is the rule, said the court, that the question whether a person is qualified as an expert is a matter ordinarily addressed to the sound discretion of the trial court, and its ruling on appeal will not be disturbed unless a clear abuse of such discretion is demonstrated. In this case the trial court decision cannot be said to reflect an abuse of discretion.

Accordingly the judgment in favor of the defendant physician was affirmed.—*Bennett v. Los Angeles Tumor Institute, et al., 227 P. (2d) 473 (California, 1951).*

MEDICAL LITERATURE ABSTRACTS

AMERICAN

A.M.A. Arch. Indust. Hyg. & Occup. Med., Chicago

3:339-444 (April) 1951

Report on Country-Wide Study of Silicosis in Metal Mines of Japan. M. Yamamoto.—p. 339.
Present Condition of Workmen's Compensation Laws, and Possible Changes. M. Dawson.—p. 350.
Retention of Air-Borne Particulates in Human Lung: II. H. D. Landahl, T. N. Tracewell and W. H. Lassen.—p. 359.
Effects of Employment on Course of Heart Disease. L. J. Goldwater and others.—p. 367.
Value and Operation of Industrial Medical Program. M. N. Howard and A. E. Hoag.—p. 375.
Evaluating Trichloroethylene Exposures by Urinalyses for Trichloroacetic Acid. A. Ahlmark and S. Forssman.—p. 386.
Health and Air Pollution: Study on Limited Budget. H. Heimann, W. F. Reindollar, H. P. Brinton and R. Sitgreaves.—p. 399.

American J. Digestive Diseases, Fort Wayne, Ind.

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Emergency Surgery in Massive Hemorrhage from High Lesser Curvature Ulcers. F. J. Rack.—p. 77.
Roentgen Features of Non-Malignant Periappendiceal and Ileocecal Lesions. C. Gottlieb, S. L. Beranbaum and M. Dorfman.—p. 79.
Studies on Ascitic Fluid in Patients with Hepatic Cirrhosis, Heart Failure and Cancer: Results of Cephalin Cholesterol Flocculation, Thymol Turbidity, Methylene Blue, Qualitative and Quantitative Bilirubin and Other Tests. G. M. Lepehne.—p. 86.
Evaluation of Findings in Giardia Infestation. C. M. McMurray and D. Cayer.—p. 90.
Metabolic Studies in Gavage and Parenteral Feeding During Prolonged Narcosis Therapy. P. M. Rike, E. A. Loomis Jr. and J. S. Clapp.—p. 92.
Determinants of Food Intake. F. Hoelzel.—p. 96.

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Infection of Gall Bladder and Diabetes. H. J. John.—p. 109.
Prognostic Significance of Nocturnal Gastric Secretion in Ulcer Patients. H. S. Zuckerman, L. W. Leiter and A. J. Kauvar.—p. 122.
*Study of Laboratory Methods for Diagnosing Endamoeba Histolytica and Their Application to 5,048 Persons from Chicago Area. V. M. Young, O. Felsenfeld, W. H. Shlaes and others.—p. 126.
Surgical Treatment of Regional Enteritis. A. J. Ryan.—p. 130.
Non-Psychogenic Functional Disorders of Gastrointestinal Tract. F. W. Wilson.—p. 137.

Laboratory Diagnosis of Endameba Histolytica.—Extensive studies were made on methods used for the detection of Endameba histolytica and of their application to the examination of more than 13,000 fecal specimens from 5,048 persons during the past seven years in Chicago and Cook County, Illinois. Combined focal and proctosigmoidoscopic specimens examined within 30 min. after collection, with the use of hematoxylin-stained slides and zinc sulfate flotation, gave optimal results. Variations in the survival time of various strains of E. histolytica in stool specimens at different temperatures were demonstrated. This irregular behavior of E. histolytica necessitates preservation of the specimen if examination is not done within 30 min. Advantages of polyvinyl alcohol and Schaudinn's fixative for hematoxylin-stained slides and the advantages of a 37% aqueous solution of formaldehyde (formalin®) and D'Antoni's stain for flotation were pointed out. Results of stool examination for components other than parasites and bacteria were compiled, and it was shown that they lack value for etiological study but are useful in guidance of symptomatic treatment. Results of surveys for E. histolytica in different groups of persons showed that 4.2% of 237 symptomless medical students and 11.6% of 796 symptomless food handlers harbored E. histolytica. Findings did not reveal so great a difference in percentage of cases of chronic diarrhea between poor patients and those of higher economic status as might be expected. A high proportion (30.6%) of physicians suffering from chronic diarrhea after overseas service had an amebic infection. The approximate proportion of E. histolytica infestations in patients suffering from chronic intestinal disturbances in the Chicago area is estimated as 20% ± 3%.

American J. Obstetrics and Gynecology, St. Louis

61:477-712 (March) 1951. **Partial Index**

*Iron Metabolism in Human Pregnancy as Studied With Radioactive Isotope, Fe^{59}. P. F. Hahn, E. L. Carothers, W. J. Darby and others.—p. 477.
Preliminary Evaluation of Cave's Roentgenographic Method of Fetal Cephalometry. T. W. McElin, S. B. Lovelady, R. W. Brandes and others.—p. 487.
*Treatment of Pelvic Inflammatory Disease in Women with Chloramphenicol. C. S. Stevenson, N. J. Kohlerman, E. F. Snider and S. S. Schlingman.—p. 498.
Chorionic Gonadotropin in Blood and Urine During Early Pregnancy. R. A. Smith, A. Albert and L. M. Randall.—p. 514.
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Use of Large Doses of Progesterone in Delaying Onset of Labor After Premature Spontaneous Rupture of Membranes. E. Eichner and K. Kunin.—p. 653.
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Treatment of Menopause. II. W. H. Perloff.—p. 670.
Cutaneous Pregnancy Test. N. Ferrero.—p. 672.
*Intravenous Alcohol as Obstetrical Analgesia. E. R. Chapman and P. T. Williams Jr.—p. 676.

Iron Metabolism in Human Pregnancy.—Iron tagged with the radioactive isotope Fe^{59} was fed in single doses ranging from 1.8 to 120 mg. to 466 healthy women at various stages of pregnancy, and the uptake of iron determined. As the dosage was increased from 9 to 18 mg. and over, the percentage of the total dose of iron found in the maternal red blood cells decreased, while the amount of iron taken up increased progressively with the dose. As gestation progressed, the uptake of iron increased to the extent that at 30 weeks' gestation and later, three or more times as much iron was absorbed as during the period before the 15th week of gestation, but a three-fold increase in dose from 39 to 120 mg. of iron after the 25th week of gestation produced only a slight increase in terms of milligrams of iron absorbed and utilized. These observations suggest that "preventive" or "protective" iron therapy, even when intensive, may be a relatively inefficient procedure in early gestation. In the latter part of gestation, such protective therapy may be more efficient, but it would seem that single doses of 120 mg. of iron offer little advantage in terms of actual iron incorporated into the maternal red blood cells over considerably smaller doses. The variation in uptake of the fetus with varying dosage did not appear to be greatly different from that of the mother. Relatively little variation in the amount of radioactive iron in the red blood cells of the infant at birth was observed for iron administered at different periods of gestation. The total red blood cell mass of the newborn infant contained on the average about 10% as much radioactive iron as was found in the mother's blood. The ratio of fetal to maternal radioactive iron per milliliter of red blood cells was about one. The uptake of radioactive iron was determined according to parity and period of gestation in

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Titles marked with an asterisk (*) are abstracted.

93 pregnant women. Before the 20th week of gestation, the median percentage uptake was significantly higher in the higher parity groups. In the second half of pregnancy, parity did not influence the uptake. These differences in iron uptake with parity reflect lower iron stores in multiparous women. The normally increased uptake late in pregnancy masked this finding during the latter half of gestation.

Chloramphenicol for Pelvic Inflammatory Disease.—Thirty-two patients, 15 with pelvic inflammatory disease of the nonpuerperal type with pelvic abscess, five with subacute salpingitis without pelvic abscess, nine with infected abortion, two with postpartum sepsis, and one with ruptured appendix were treated with chloramphenicol (chloromycetin®). The causative bacteria were found to be chiefly Escherichia coli, nonhemolytic streptococci, and Aerobacter aerogenes. All but three of the patients had mixed infection. One patient's infection was caused by Staphylococcus albus, and a second patient had beta hemolytic streptococcic septicemia following criminal abortion. Chloramphenicol was administered in divided doses of 0.5 gm. enterally every three hours (total daily dose 2 gm.) for 10 days. Twenty-one of the 32 patients had previously received penicillin, sulfadiazine, and/or streptomycin. There was no response to these agents in 16 cases, a poor and inadequate response in three, and a good response in two, whereas only three of the 32 patients failed to respond adequately to chloramphenicol. The clinical response to chloramphenicol consisted of pronounced symptomatic improvement, usually within 48 hours; rapid disappearance of the peritonitis, and subsequent anatomic regression of the tubo-ovarial inflammatory masses, the patients being ready for exploratory laparotomy within about three to four weeks in the average case. Women who had large pelvic abscesses were treated so effectively with chloramphenicol that posterior colpotomy, with drainage of the abscess, was not necessary for a rapid cure in any of the authors' patients who were treated with this antibiotic from the start.

Intravenously Administered Alcohol as an Obstetric Analgesic.—Intravenously administered alcohol was used alone or combined with meperidine hydrochloride (demerol®) as an obstetric analgesic in 100 women. Alcohol was administered by three general methods. Sixty patients received 7½% alcohol in 5% dextrose in distilled water; the same solution plus meperidine hydrochloride was administered to 27 patients, and 25% alcohol was given to 13 patients. The 7½% alcohol solution combined with small amounts of meperidine hydrochloride is the method of choice. The analgesic effect was excellent and could be altered to suit the obstetrician. There was complete amnesia with the heavier doses and a proportionate degree with smaller doses. Aside from transitory nausea and vomiting, the side effects were negligible. There was no headache, anorexia, or dizziness. There was no maternal death. One infant was stillborn, but there was no reason to believe that the alcohol was at fault. Postpartum bleeding was not increased. The disadvantages of this method are largely those of inconvenience to the attendant. The depth of narcosis must be observed and controlled. Alcohol is of particular value in premature labor and patients with cardiac disease. It appears from trial and theory that the drug should be valuable in eclampsia. Intravenously administered alcohol, as a safe and effective analgesic agent for both mother and child, deserves a place in the armamentarium of drugs applicable to obstetrics.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

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Evaluation of Public Health Measures for Control of Syphilis: Epidemiologic Study. J. E. Moore.—p. 101.
Are Venereal Diseases Disappearing? Over-All Picture Throughout the Country. W. H. Aufranc.—p. 135.
Syphilis and Gonorrhea, New York City: Statistical Review of Registration, Particularly During Five-Year Period, 1945-1949. G. J. Drolet. —p. 138.
Effects of Sex, Castration, and Testosterone upon Susceptibility of Rabbits to Experimental Syphilis. H. J. Magnuson, B. J. Rosenau and B. G. Greenberg.—p. 146.
Studies on Life Cycle of Spirochetes: V. Life Cycle of Nichols Nonpathogenic Treponema Pallidum in Culture. E. D. DeLamater, M. Haanes and R. H. Wiggall.—p. 164.
Id.: VI. Life Cycle of Nichols Nonpathogenic Treponema Pallidum in Embryonated Hen's Egg. E. D. DeLamater, M. Haanes and R. H. Wiggall.—p. 180.

Anesthesiology, New York

12:135-260 (March) 1951

Newer Anaesthetic Agents in Children, with Special Reference to Trichlorethylene and Kemithal. C. R. Stephen and H. M. Slater.—p. 135.
Intravenous Supplementation During Nitrous Oxide Anesthesia: Application of Multiple Covariant Analysis to Comparison of Demerol, Morphine and New Potent Analgesic Drug (15431). D. S. Wilkins, S. C. Cullen and M. Brotman.—p. 145.
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Protection by Dibenamine Against "Spontaneous" Arrhythmias Occurring During Cyclopropane Anesthesia. M. Nickerson and H. O. Brown. —p. 216.
Use of Dromoran Hydrobromide (3-Hydroxy-N-Methylmorphinan Hydrobromide) for Preoperative Medication. V. K. Stoelting, R. A. Theye and J. P. Graf.—p. 225.
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Annals of Internal Medicine, Lancaster, Pa.

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Glomerular Lipidosis in Intercapillary Glomerulosclerosis. S. L. Wilens, S. K. Elster and J. P. Baker.—p. 592.
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Effect of Single Inspiration in Lead III and Precordial Lead of Human Electrocardiogram. G. L. Norris and E. Massie.—p. 641.
Clinical Notes on Epidemic of Poliomyelitis. N. M. Shutkin.—p. 655.
Hypopituitarism: Studies in Pituitary Tumors and Simmonds' Disease. K. E. Paschkis and A. Cantarow.—p. 669.
Diabetes and Pregnancy: With Special Reference to Prediabetic State. J. M. Moss and H. B. Mulholland.—p. 678.
*Treatment of Two Patients with Hepatorenal Syndrome and Acute Renal Failure by Exsanguinotransfusion. I. Snapper and L. E. Schaefer. —p. 692.
Virus Encephalitis During Poliomyelitis Epidemic: Report of Five Cases. I. Dravin, J. H. Coffey and W. C. Dine.—p. 705.
"Improvement" in Hypertensive Pattern of Electrocardiogram. R. S. Palmer.—p. 712.
*Therapy of Subacute Enterococcus (Streptococcus Fecalis) Endocarditis. L. Loewe, S. Candel and H. B. Eiber.—p. 717.
Variations in Urinary Dilution and Concentration Among Healthy Males Under Simple Standard Conditions. W. E. Storey.—p. 737.
Electrocardiographic Findings in Cardiac Aneurysm. R. A. Steven.—p. 747.
*Fatal Aplastic Anemia Due to Streptomycin: Case Report and Brief Review of Pertinent Literature. C. R. Womack and C. B. Reiner. —p. 759.

Exsanguinotransfusion in Hepatorenal Syndrome.—Exsanguinotransfusion was used in the treatment of two severely uremic patients with hepatorenal syndrome following hepatitis. In both patients prior to transfusion the daily urinary secretion was reduced to between 100 and 200 cc. for several days, and the blood urea nitrogen and creatinine were elevated to about 110 and 10 mg. per 100 cc. respectively. In one patient a preliminary dialysis with the artificial kidney was performed. When on the next day the urinary secretion had decreased to 7 cc. and the general condition had deteriorated, 7.5 L. of citrated blood was given and 7 L. was withdrawn. Diuresis started within 24 hr., and the patient recovered. In the second patient two exsanguinotransfusions were performed four days apart. Diuresis began after the first. While these may have been coincidences, it is likely that the introduction of normal blood protein and alkali (sodium citrate) had a beneficial effect in these cases. It is also possible that some toxic substance was removed.

Therapy of Streptococcus Fecalis Endocarditis.—During the treatment of seven patients with endocarditis due to Streptococcus fecalis, Loewe and associates found that this organism was much more resistant to therapy than Str. viridans. Accordingly they evolved a more intensive and prolonged therapeutic program that produced recovery in three patients with Str. fecalis endocarditis. This consisted of the daily intravenous administration of 10 million units of penicillin in Ringer's solution or, in cases of congestive heart failure, in 5% dextrose in distilled water. The volume of the venoclysis did not exceed 1,000 cc. per 24 hr. Heparin was added in a dose of 50 mg. daily to neutralize the local thrombosing influence of the large doses of penicillin, to prevent deposition of thrombotic masses on the valves, and to promote repair of the endocardial lesions. If ineffective blood levels were obtained with this schedule, more penicillin was given along with enhancing agents such as carinamide (staticin®). Treatment lasted not less than five weeks in previously untreated patients and eight weeks in deteriorated or previously treated patients. If the clinical response was unsatisfactory, streptomycin was added for a short period. Supportive measures, such as transfusions, hematinics, and multivitamin preparations were used as indicated. In the presence of congestive heart failure digitalis and mercurial diuretics were given and sodium and oral fluids were restricted. Penicillin was temporarily administered intramuscularly if necessary. The aim of the program was to terminate the infection during the first span of treatment.

Aplastic Anemia Due to Streptomycin.—The authors report on a man, 76, with laryngeal and pulmonary tuberculosis in whom fatal aplastic anemia developed during streptomycin therapy. Death resulted from gastrointestinal bleeding secondary to thrombopenia. This is the third reported case of this complication of streptomycin therapy.

Annals of Surgery, Philadelphia

133:433-576 (April) 1951

Biologic Principles in Healing of Fractures and Their Bearing on Treatment. D. B. Phemister.—p. 433.

*Progressive Constrictive Occlusion of Abdominal Aorta with Wiring and Electrothermic Coagulation: One-Stage Operation for Arteriosclerotic Aneurysms of Abdominal Aorta. A. H. Blakemore.—p. 447.

Problem of Esophageal Replacement by Jejunum with Particular Reference to Influence upon Circulation of Staging Division of Mesenteric Vessels: Experimental Study and Case Report. H. B. Schumacker Jr. and J. S. Battersby.—p. 463.

Mechanical Strength of Esophageal Anastomoses. R. W. Postlethwait, M. Weinberg, L. B. Jenkins and W. S. Brockington.—p. 472.

Efficacy and Application of Intussuscepted Conical Valve in Preventing Regurgitation and Leakage of Intestinal Contents. D. E. Basso.—p. 477.

Observations on Bacteriology of Choledochal Bile. R. E. Anderson and J. T. Priestley.—p. 486.

Lumbar Spinal Arachnoiditis: Complication of Intervertebral Disc Operation. E. A. Smolik and F. P. Nash.—p. 490.

Platybasia: Report of 10 Cases with Comments on Familial Tendency, Special Diagnostic Sign, and End Results of Operation. W. B. Scoville and I. J. Sherman.—p. 496.

Hepatic, Cystic and Retroduodenal Arteries and Their Relations to Biliary Ducts: with Samples of Entire Celiacal Blood Supply. N. A. Michels.—p. 503.

Anatomic and Surgical Significance of Lumbar Sympathetic Nervous System. R. I. Lowenberg and D. E. Morton.—p. 525.

Complications and Recurrences Following Inguinal Hernia Repair. A. H. Levy, R. S. Wren and M. N. Friedman.—p. 533.

New Incision for Pericardiectomy. J. Johnson and C. K. Kirby.—p. 540.

Percutaneous Arterial Catheterization in Dogs with Special Reference to Aortography. E. C. Pierce II.—p. 544.

*Meconium Peritonitis. G. B. Packard and L. E. Reynolds.—p. 548.

Total Excision of Scalp and Portions of Face; Restoration by Skin Grafting: Surgical Management of Massive Cylindroma of Scalp and Face. B. Goldman.—p. 555.

Hemangio-Endothelioma with Diffuse Involvement of Spleen and Bone: Case Report. W. H. Kastl.—p. 561.

Incision and Method of Wound Closure for Radical Mastectomy. T. G. Orr Jr.—p. 565.

Utilization of Scar Tissue in Bridging Tendon Defects. W. P. Whalen.—p. 567.

Paralysis of Deglutition, Post-Poliomyelitis Complication Treated by Section of Cricopharyngeus Muscle. S. Kaplan.—p. 572.

Treatment of Arteriosclerotic Aneurysms of Aorta.—Blakemore describes a new one-stage treatment of arteriosclerotic aneurysm of the abdominal aorta that combines partial constriction of the aorta, intra-arterial wiring, and electrothermic coagulation. Partial constriction is accomplished by the placement around the aorta just proximal to the aneurysm of a slingshot rubber band sheathed in a polyethylene (polythene®) film containing dicetyl phosphate. The elasticity of the rubber band minimizes erosion of the vessel wall, and the irritative action of the polyethylene film produces a fibrous tissue reaction that further protects against subsequent rupture at the site of the band. The aneurysm proper is filled with coils of fine silver wire that impede the flow of blood and provide a framework on which a clot can form. Controlled heating of the wire by means of an electric current produces clotting of the blood near the walls of the vessel where the current is slowest but none in the center where the current is more rapid. This prevents sudden obliteration of the lumen of the aorta with consequent loss of blood supply to the lower extremities. The use of this technique, sometimes with modification, resulted in improvement of the symptoms and roentgenographic findings in eight cases of fusiform aneurysm of the aorta during an observation period of from several months to over a year.

Meconium Peritonitis.—Meconium peritonitis is a sterile chemical or foreign body peritonitis resulting from intestinal perforation and escape of meconium into the general peritoneal cavity. When this occurs during intrauterine life it is usually due to intestinal obstruction caused by stenosis, atresia, volvulus, or constricting bands. Under these circumstances it is not necessarily fatal. Meconium peritonitis occurring at or immediately after birth may be the result of intestinal obstruction or trauma or both. The characteristic signs are early vomiting and progressive distention. Diagnosis is facilitated by roentgen demonstration of dilated intestinal loops and free air in the abdominal cavity. Prognosis is poor, but early recognition and operation before the sterile meconium has become contaminated with bacteria have saved some of these patients. The author reports two cases. In one peritonitis resulted from intestinal obstruction before birth. Operation shortly after birth proved futile because dense prenatal adhesions prevented reconstruction of the intestinal tract. In the other infant perforation was the result of birth trauma, and recovery resulted after early surgical treatment.

Cancer, New York

4:221-440 (March) 1951. **Partial Index**

Habits of Medical Care. R. A. King and J. E. Leach.—p. 221.

Telescopic Pancreaticojejunostomy. J. S. Binkley.—p. 226.

Carcinoma of Pancreas: Effect of Histological Type and Grade of Malignancy on Its Behavior. J. R. Miller, A. H. Baggenstoss and M. W. Comfort.—p. 233.

Intracranial-Pressure Studies Incident to Resection of Internal Jugular Veins. E. D. Sugarbaker and H. M. Wiley.—p. 242.

Results of Treatment of Squamous-Cell Carcinoma of Cervix. J. H. Holzaepfel.—p. 251.

Cytological Recognition of Carcinoma in Situ. J. W. Reagan.—p. 255.

Preinvasive Adenocarcinoma of Appendix: Report of 16 Cases. W. McCollum and E. R. Pund.—p. 261.

Comparative Morphogenesis of Extragenital and Gonadal Teratoid Tumors. N. B. Friedman.—p. 265.

Multiple Origin of Minute Bronchiolargenic Carcinomas: Report of Case. D. M. Spain and V. Parsonnet.—p. 277.

*Cytology in Diagnosis of Gastric Cancer. J. F. Seybolt, G. N. Papanicolaou and W. A. Cooper.—p. 286.

Tissue Localization and Excretion Routes of Radioactive Diethylstilbestrol. G. H. Twombly and E. F. Schoenewaldt.—p. 296.

Metastases, Simulating Mammary Cancer, in Prostatic Carcinoma Under Estrogenic Therapy. J. H. Campbell and S. D. Cummins.—p. 303.

Paratesticular Interstitial-Cell Tumor. C. G. Tedeschi and F. E. Burke.—p. 312.

*Hormonal Therapy in Cancer of Breast: I. Effect of Testosterone Propionate Therapy on Clinical Course and Hormonal Excretion. A. Segaloff, D. Gordon, B. N. Horwitt and others.—p. 319.

Prognosis for Malignant Melanoma in the Pregnant Woman. G. T. Pack and I. M. Scharnagel.—p. 324.

Classification of Primary Tumors of Bone. L. Lichtenstein.—p. 335.

Attempts to Determine Harmful Effects of Pulsed Ultrasonic Vibrations. L. A. French, J. J. Wild and D. Neal.—p. 342.

Relative Frequency of Cancer. B. McSwain and R. B. Williams Jr.—p. 416.

Cytology in Diagnosis of Gastric Cancer.—Cytological observations were reported in 875 patients who at one time in their clinical course were suspected of having gastric cancer. Fifty-five (32.8%) of the 168 patients who had cancer showed definite recognizable cancer cells in the smears made from aspirated specimens from the stomach; 31 (18.4%) were suspicious, and 82 (48.8%) were negative. In 25 cases of gastric carcinoma in

which lavage specimens were collected and processed promptly, there were correct positive reports in 15 (60%), suspicious reports in two (8%), and definitely false negative reports in eight (32%). It is felt that 60% is about the limit of diagnostic accuracy of any of the lavage methods tried by the authors. Although cytology may be of some help to clinicians it falls far short of being the answer to the existing diagnostic problem. Methods of getting more cell groups from the gastric walls, of concentrating them, and of preparing the material for cytological readings are aspects of the cytological diagnosis of gastric cancer that need further experimental development in the laboratory.

Hormonal Therapy in Breast Cancer.—Forty-eight women between 26 and 75 with cancer of the breast were treated with testosterone propionate. The drug was given in vegetable oil in doses of 100 mg. three or four times weekly or of 50 mg. daily. The therapy period varied from one month to more than one year. Urinary excretion of 17-ketosteroids, gonadotropic hormones, lactogenic hormone and glycogenic corticoids, and urinary creatine-creatinine ratios were measured. Of the 48 patients, 13 (27%) showed objective regression of the lesions. The regression lasted over an average period of 31.3 weeks, the longest being 50 weeks. In the remaining 35 patients there was either progression or no change. In none of the 10 patients aged less than 40 was a good response obtained, whereas a third of those over 40 showed improvement. The length of time the tumor was present before the institution of testosterone therapy was approximately the same for those showing progression as for those who showed improvement. All patients showed the expected increase in 17-ketosteroid excretion as well as the expected decrease in gonad-stimulating hormone excretion. In the patients who improved, there was a decrease of doubtful significance in urinary corticoids and conversely an increase in corticoids in the patients who did not improve. Excretion of lactogenic hormone (prolactin) for both groups of patients increased. In general, the patients who improved showed a decrease in urinary creatine, whereas those who failed to improve showed an average increase in urinary creatine. Seven patients initially had a lower urinary gonad-stimulating hormone value than expected from their age and endocrine status. The authors believe that the cachexia resulting from the extensive disease in these patients induced a sort of initial physiological hypophysectomy with respect to gonad-stimulating hormone. Six of these seven patients failed to respond favorably to therapy.

Connecticut State Medical Journal, Hartford

15:293-364 (April) 1951

Medicine in Stratford in Its Early Days. S. B. Weld.—p. 305.
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Anthrax—an Industrial Disease. B. S. Dignam.—p. 316.
Anthrax in Connecticut with Case Report. N. T. Phillips.—p. 317.
NPH Insulin: Crystalline Form of Protamine Zinc Insulin. B. Greenhouse. —p. 321.
Preventive Aspects of Chronic Disease. E. M. Cohart.—p. 325.

Endocrinology, Springfield, Ill.

48:245-344 (March) 1951. **Partial Index**

Effects of ACTH on Metabolism of Radioactive Calcium in Normal and Hypophysectomized Rats. F. Ulrich, D. H. Copp, C. W. Asling and others.—p. 245.
Effect of Induced Ovulation on Pregnancy. H. O. Burdick and M. Crump. —p. 273.
Insulin and Adrenocorticotropin Labeled with Radio-Iodine. J. W. Ferrebee, B. B. Johnson, J. C. Mithoefer and J. W. Gardella.—p. 277.
Some Factors That Influence Release of Iodine from Thyroid Gland. J. Wolff.—p. 284.
Prevention and Reversal Despite Hyperglycemia of Glycogen Infiltration ("Hydropic Degeneration") in Pancreas in Alloxan Diabetes in Rabbit. G. L. Duff and W. E. Toreson.—p. 298.
Effect of Adrenalectomy in Rat upon Rate of Growth of Transplantable Tumors. D. J. Ingle and B. L. Baker.—p. 313.
Method of Assaying Adrenal Cortical Hormones Based on Decrease in Circulating Eosinophil Cells of Adrenalectomized Mice. R. S. Speirs and R. K. Meyer.—p. 316.
Effect of Hypophysectomy on Uptake of Radioactive Iodine by Thyroid of Rat. R. V. Randall and A. Albert.—p. 327.
The in Vivo Determination of Biological Decay of Thyroidal Radioiodine. A. Albert.—p. 334.

Journal of Bone and Joint Surgery, Boston

33A:279-560 (April) 1951. **Partial Index**

Vascular Epiphyseal Changes in Congenital Dislocation of Hip: Results in Adults Compared with Results in Coxa Plana and in Congenital Dislocation Without Vascular Changes. W. K. Massie.—p. 284.
*Follow-Up Study of Use of Refrigerated Homogenous Bone Transplants in Orthopaedic Operations. P. D. Wilson.—p. 307.
Subtrochanteric Osteotomy and Spline Fixation for Certain Disabilities of Hip Joint: Preliminary Report. M. Cleveland, D. M. Bosworth and A. D. Pietra.—p. 351.
Diamond-Shaped Graft from Ilium for Non-Union of Tibia. H. C. Blair. —p. 362.
Slipping of Upper Femoral Epiphysis: Pathological Study. P. Lacroix and J. Verbrugge.—p. 371.
Fractures of Anterior Process of Calcaneus. M. Gellman.—p. 382.
Fractures of Neck of Femur in Children: Clinical Study. G. Allende and L. G. Lezama.—p. 387.
*Fibrous Dysplasia of Bone. P. Strassburger, C. Z. Garber and H. Hallock. —p. 407.
Fixation of Small But Important Bone Fragments with Hook Plate. W. A. Zuelzer.—p. 430.
Improved Type of Arthroplasty of Hip Joint. A. F. DePalma.—p. 437.
Xanthomatous Joint Tumors. W. L. Minear.—p. 451.
Synovial Sarcomata. J. F. Tillotson, J. R. McDonald and J. M. Janes. —p. 459.
Skin-Tight Casts for Treatment of Club-Foot. J. W. White and W. H. Gulledge.—p. 475.
Transplantation of Tibial Tubercle. D. C. McKeever.—p. 478.
Use of Muscle Relaxants as Aid in Diagnosis and Therapy of Acute Low-Back Disorders. E. B. Schlesinger and F. E. Stinchfield.—p. 480.
Role of Tensile Stress in Mechanism of Femoral Fractures. F. G. Evans, H. E. Pedersen and H. R. Lissner.—p. 485.
Recurrent Subluxation of Ankle: With Special Reference to Peroneal-Nerve Block as Diagnostic Aid. M. L. Clayton, A. W. Trott and R. Ulin.—p. 502.
Infantile Ankylosis of Temporomandibular Joint: Treatment by Resection of Mandibular Condyle. T. F. McManis and E. Dehne.—p. 505.

Refrigerated Homogenous Bone Transplants.—Refrigerated homogenous sterile bone grafts were used for 278 orthopedic operations on 214 patients in the course of three years. Wound infection occurred in four patients (1.4%), and there was loss of the grafts in two (0.7%). In a follow-up study of final results from the refrigerated homogenous bone grafts, 144 patients were traced who had undergone 179 orthopedic operations for a large variety of conditions. On the basis of the number of the operations, results were successful in 80% and unsuccessful in 11%. Fifteen patients had undergone operations too recently for a determination of the results. If four patients in which the failure was unrelated to bone healing are eliminated, the rate of failure can be lowered to 8%. Results were identical with those from the use of autogenous grafts, except that in some instances healing appeared to be somewhat slower. Healing of the grafts took place by a process of invasion, absorption, and replacement similar to that of autogenous bone grafts. With careful technique, homogenous bone grafts may be preserved for long periods of time for surgical use. Such grafts are well tolerated by human tissues, and the risk of infection is no greater than with autogenous grafts. The operation of a bone bank is safe and practical. It offers great advantages to the patient and the surgeon from the standpoint of availability, abundance, and elimination of the necessity of a secondary operation to obtain bone.

Fibrous Dysplasia of Bone.—Four male and five female patients with fibrous dysplasia of bone are reported on. The age of the patients at onset ranged from 15 mo. to 33 yr. Their present ages range from 5 to 48 yr. Experience in these nine cases indicates that the fibrous dysplasia of bone may present a variable clinical picture. There was skin pigmentation of the café au lait type in five of the patients. Sexual precocity was seen only in the two patients with the full syndrome complex, i. e., lesions of the skin, bones, and endocrine system. The number of bones involved ranged from one to 15. The alkaline phosphatase was elevated in two patients. There was only one patient who did not have a fracture at some time during the period of observation. Five of the patients showed deformities ranging from mild coxa vara to severe genu varum. In adults there may be rather extensive lesions in more than one bone without symptoms or serious impairment of function. In five of the nine patients curettage of the bone lesions and packing of the areas with bone

chips were carried out. In the three patients with relatively small lesions results were good. In the two patients with large lesions where the abnormal tissue could not be entirely removed, the chips were absorbed on three occasions. In one patient osteotomies were performed to correct the severe bowing. The bone at the site of osteotomy united, but the deformities have begun to recur above the level of the osteotomies. In the usual case a summation of clinical, roentgenographic, and microscopic findings is desirable for diagnosis of this disease. When islands of cartilage are present, the diagnosis can be made on the basis of the gross or microscopic examination alone.

Journal of Experimental Medicine, New York

93:297-414 (April) 1951. **Partial Index**

Lipolytic Enzyme in Reactive Histiocytes of Guinea Pigs with Experimental Encephalomyelitis. F. S. Vogel.—p. 305.
Effect of Liver Regeneration on Tumor Formation in Rats Fed 4-Dimethyl-Aminoazobenzene. A. D. Glinos, N. L. R. Bucher and J. C. Aub.—p. 313.
Mechanism of Proteinuria: III. Comparison of Functional and Structural Aspects of Effects of Certain Intraperitoneally Administered Proteins on Hemoglobin Excretion in Rat. R. W. Lippman, H. J. Ureen and J. Oliver.—p. 325.
Role of 1-Methionine in Virus Propagation. W. W. Ackermann.—p. 337.
Determination of Inherited Traits of H. Influenzae by Desoxyribonucleic Acid Fractions Isolated from Type-Specific Cells. H. E. Alexander and G. Leidy.—p. 345.
Sustained Hypertension Following Administration of Desoxycorticosterone Acetate. S. M. Friedman, C. L. Friedman and M. Nakashima.—p. 361.
Sustained Hyperlipemia Induced in Rabbits by Means of Intravenously Injected Surface-Active Agents. A. Kellner, J. W. Correll and A. T. Ladd.—p. 373.
Elaboration of Desoxyribonuclease by Streptococci in Resting State and Inhibition of Enzyme by Substance Extractable from the Cocci. A. W. Bernheimer and N. K. Ruffier.—p. 399.

Journal Lab. and Clinical Medicine, St. Louis

37:499-664 (April) 1951

Effect of Desoxycorticosterone and Propylene Glycol in Experimental Hypertension. W. D. Davis Jr., A. Segaloff, W. S. Jacobs and J. B. Callahan.—p. 499.
Effects of Potassium Salts in Subjects with Heart Disease. H. Brown, G. L. Tanner and H. H. Hecht.—p. 506.
Significance of Decreased Dye Clearance by Liver Following Portacaval Anastomosis. J. F. Laws and T. C. Everson.—p. 515.
Serum Alkaline Phosphatase in Dogs Following Ligation of Hepatic Veins. J. Mithoefer and S. Rapoport.—p. 520.
Alkaline Phosphatase of Cell Nuclei. G. Gomori.—p. 526.
Serum Lipid and Protein Fractions: III. Diseases of Mesenchyme. I. Leinwand.—p. 532.
Serum Proteins in Pregnancy: Thermal Coagulation and Binding of Anions. G. H. Miller Jr., E. Davis, A. G. King and C. B. Huggins.—p. 538.
Relationship of Xanthoproteic Indices to Quantitative Phenol Levels in Various Azotemic States. P. Gaberman, D. H. Atlas, J. Isaacs and others.—p. 544.
Salt Losing Conditions: Renal Defect in Tuberculous Meningitis. S. Rapoport, C. D. West and W. A. Brodsky.—p. 550.
Influence of Nucleic Acid upon Fluorescence of Nuclei and Cytoplasm After Injection of Aromatic Diamidines. I. Snapper, B. Schneid, F. Lieben and others.—p. 562.
Nonspecific Inhibition by Serum and Urine in Microbiologic Assay of Antibiotics. R. B. Gerstung.—p. 575.
Toxic Effect of Buffered Saline Solutions on Viability of Brucella Abortus. G. C. de Mello, I. S. Danielson and J. S. Kiser.—p. 579.
*Effect of Combinations of Antibiotics on Pseudomonas Aeruginosa and on Proteus Vulgaris, in Vitro and in Vivo. C. W. J. Armstrong and A. E. Larner.—p. 584.
Eosinophile Response in Chronic Disease and Malnutrition. L. O. Brenner, S. O. Waife and M. G. Wohl.—p. 593.
*Some Observations on L. E. Cell. A. Suksta and C. L. Conley.—p. 597.
Adrenocorticotrophic Hormone (ACTH) in Treatment of Experimental Air-Borne Influenza Virus Type A Infection in Ferret. R. B. Hull and C. G. Loosli.—p. 603.
Effect of Cortisone on Pathologic Responses of Guinea Pigs Infected Cutaneously with Fungi, Viruses, and Bacteria. A. M. Kligman, G. D. Baldridge, G. Rebell and D. M. Pillsbury.—p. 615.

Effect of Combinations of Antibiotics.—In vitro and in vivo tests were made of the sensitivities of seven strains of Pseudomonas aeruginosa and four strains of Proteus vulgaris to various concentrations of aureomycin, chloramphenicol, penicillin, dihydrostreptomycin, and terramycin, singly and in combination. The in vitro tests on Ps. aeruginosa showed that in certain combinations the bactericidal properties of the drugs were increased. There was a pronounced reduction in concentration of antibiotic required for the aureomycin-terramycin and the chloramphenicol-terramycin combinations. A combination of penicillin with dihydrostreptomycin resulted in a reduction of the bactericidal concentrations required of each, but these were still relatively high. The triple combination of aureomycin-dihydrostreptomycin-terramycin also showed great reduction in required concentration; however, this combination is not recommended, since aureomycin and terramycin are effective without dihydrostreptomycin, which leads rapidly to resistance in the organism. The results with penicillin in dual combinations did not appear to justify its trial in triple combinations. There was one case of apparent drug antagonism; i. e., the chloramphenicol-penicillin combination required higher concentrations of the antibiotics than when the drugs were used alone. In the in vitro sensitivity tests on the four strains of Ps. vulgaris aureomycin-dihydrostreptomycin and dihydrostreptomycin-terramycin showed significant decreases. Triple combinations were again less promising, with the exception of aureomycin-dihydrostreptomycin-terramycin, which required a much smaller concentration than when the drugs were given alone. No antagonism between the drugs was noted in these combinations. The most promising in vitro combinations for Ps. aeruginosa were also effective in vivo. The dual combinations were especially effective. Treatment with an aureomycin-chloramphenicol-terramycin combination was tried without particular benefit. Antibiotic combinations including dihydrostreptomycin were used for in vivo experiments with P. vulgaris. For some unknown reason a mixed culture of P. vulgaris strains that were individually resistant to dihydrostreptomycin in vitro proved to be very sensitive to dihydrostreptomycin in experimentally infected mice. The authors suggest that in each case the drug or combination of drugs used should be determined by preliminary laboratory investigation.

Observations on L. E. Cell.—Smears of heparinized blood or marrow from 115 patients with various diseases were examined for L. E. cells. The cells were found in 14 of 21 cases of disseminated lupus erythematosus but were not observed in any other condition (i. e., periarteritis nodosa, acute rheumatic fever, rheumatoid arthritis, thrombopenic purpura, multiple myeloma, and dermatitis medicamentosa). The number of L. E. cells and rosettes found on examination of the heparinized blood buffy coat smears roughly paralleled the number occurring in the heparinized marrow buffy coat preparations from the same patient. In the patients with acute disseminated lupus erythematosus who were treated with pituitary adrenocorticotropic hormone (ACTH) or cortisone, the number of L. E. cells and rosettes present in the blood decreased but did not disappear during therapy. There was no apparent relation between the total white blood cell count and the number of L. E. cells seen in the buffy coat smears. It was further demonstrated that L. E. cells may be formed in the absence of anticoagulant. The authors did studies to determine the period of time required for the formation of L. E. cells. Their formation was completely inhibited by low temperatures, and after blood had been chilled at least 10 min. of incubation at 37 C. was required for them to form. In all the specimens incubated at 37 C. for one minute or longer, extracellular material closely resembling the homogeneous, purplish mass seen in L. E. cells was observed. Incubation of heparinized blood for 15 minutes at 37 C. appeared adequate for optimal L. E. cell production.

Journal-Lancet, Minneapolis

71:123-168 (April) 1951

Tuberculosis at the Mid-Century. R. H. Frost.—p. 124.
Controlling Tuberculosis in a New Nation: 1950 Journal-Lancet Lecture. J. A. Myers.—p. 127.
Development of Upright Balanced Fluoroscopic Unit in Minnesota. E. L. Tuohy.—p. 132.
Continuity of Program—Necessity in Tuberculosis Control Among American Indians. H. DeLien.—p. 136.
Animal Infections in Man. P. S. Dodd.—p. 138.
The Forgotten Test. J. F. Briggs.—p. 140.
Tuberculosis Problems in Kent County, Michigan. H. D. Ireland.—p. 142.
Diagnosis and Surgical Treatment of Congenital Heart Disease. W. J. Potts.—p. 145.
Controlling Tuberculosis on the College Campus: Panel Discussion. L. J. Moorman, J. W. Middleton, H. A. Kemp and E. Strauss.—p. 152.

Journal of Nervous and Mental Disease, New York

113:189-282 (March) 1951

Some General and Neurologic Aspects of Atomic Medicine. D. I. Arbuse.—p. 189.
*Accident Proneness in Multiple Sclerosis: Relationship to Trauma, with Medicolegal Implications. A. E. Bennett.—p. 198.
Modification of Electroshock Convulsion by Means of Curare, Intravenous Barbiturate and Airway. M. Brody.—p. 211.
Facialgia (Atypical Facial Neuralgia): Report of Cases Associated with Tic Douloureux. A. A. Raney, R. B. Raney and C. R. Hunter.—p. 223.
Treatment of Schizophrenia: Comparison of Three Methods: Brief Psychotherapy, Insulin Coma and Electric Shock. J. S. Gottlieb and P. E. Huston.—p. 237.
Further Observations on 62 Lobotomized Psychotic Male Veterans at the Veterans Hospital, Northport, New York. L. Drubin.—p. 247.

Accident Proneness in Multiple Sclerosis.—Bennett reviews the literature and discusses three cases from his own medicolegal records on the relationship between trauma and multiple sclerosis. Although medical evidence is against the theory that trauma causes or exacerbates multiple sclerosis, compensation courts are granting large awards to such claimants. Reasons for this seem to be the failure to understand the course of the disease, with its spontaneous remissions and progressive pathology; the peculiar type of personality changes, manifested in euphoria, overconfidence, and poor judgment; the symptoms of motor paresis, ataxia, and disturbed equilibrium. These factors make patients with multiple sclerosis more prone to have accidents and to accept them as causing or aggravating their symptoms. The efforts of an adroit attorney, together with a sympathetic judge, enable the claimant often to obtain a large, unjustified award for total permanent disability. There is increasing need for a unified medical opinion to guide courts in these decisions. Neurologists have too often certified that an accident aggravated existing symptoms. The hypothetical question, a favorite legal device, undoubtedly biases opinion, since it can be and frequently is so worded that the expert has to admit that trauma as an etiological factor lies within the realm of possibility. A free, unbiased statement of the medical evidence should replace the hypothetical question. Expert witnesses, drawn from a panel of qualified neurologists, should replace the present method of retaining one or more experts expected to render favorable opinions to the side retaining them.

Journal of Pediatrics, St. Louis

38:411-536 (April) 1951

*Pertussis: Clinical Comparison of Newer Antibiotics. C. E. Booher, J. B. Farrell and E. J. West.—p. 411.
Terramycin in Treatment of Pneumonias of Childhood: Report of 10 Cases. C. H. Wooding Jr. and R. B. Scott.—p. 423.
Treatment of Typhoid Fever with Terramycin. W. A. Reilly and A. M. Earle.—p. 428.
Congenital Valvular Pulmonary Stenosis With or Without Interatrial Communication: Physiologic Studies as Diagnostic Aids. F. H. Adams, L. G. Veasy, J. Jorgens and others.—p. 431.
Unusual Anomaly of Aortic Arch. A. Goldwyn.—p. 442.
*Role of Rh Factor in Etiology of Cerebral Palsy. I. P. Sobel and H. S. Wilhelm.—p. 447.
Significance of Delayed Development in Diagnosis of Cerebral Palsy. E. Denhoff and R. H. Holden.—p. 452.
Epidemic Diarrhea of Infancy. A. D. Rubenstein and S. A. Britten.—p. 457.
Technique of Pneumoencephalography in Children: Comparative Results with Air and Oxygen Injection. L. Casamajor, R. W. Laidlaw and P. J. Kozinn.—p. 463.
Anomalous Anal Papillae in Infants and Children. S. J. Nichamin and H. I. Kallet.—p. 468.
Modern Concept of Breast Feeding. M. I. Levine.—p. 472.
Emotional Reactions and Behavior of Children in the Home: Method of Study. R. Winkley, K. Jackson, O. A. Faust and others.—p. 476.
Chart on Eruption of Deciduous Teeth for the Pediatrician's Office. H. V. Meredith.—p. 482.
New Suckling Device for Artificial Infant Feeding. R. D. Hawkins.—p. 484.
Self-Lubricating Syringe. A. Bloxsom.—p. 491.
*Twin Fetuses in Fetu. R. E. Gross and H. W. Clatworthy Jr.—p. 502.

Antibiotics in Pertussis.—The comparative clinical effectiveness of streptomycin, aureomycin, chloramphenicol, and terramycin was studied in 160 cases of uncomplicated pertussis. Streptomycin appeared to be of only questionable value, but the remaining three antibiotics were equally effective in shortening the duration of the whooping stage. Chloramphenicol and terramycin also significantly shortened the duration of fever. The effective minimum dose for aureomycin, chloramphenicol, and terramycin was 50 mg. per kilogram of body weight per day. At this dose the antibiotics were well tolerated. There was no therapeutic advantage in giving the drugs in combination. In patients seen after this study there seemed to be increased bacterial resistance to these antibiotics. The authors conclude that the ideal drug for the treatment of pertussis has not been developed.

Rh Factor and Cerebral Palsy.—The authors studied 98 children with cerebral palsy and their mothers to determine whether isoimmunization to the Rh or ABO blood factors played an important role in the production of this condition. The percentage of Rh-negative mothers and Rh-positive children in the group was approximately the same as found in the general population, but three of the children had erythroblastosis fetalis, a somewhat higher incidence than in the general population. ABO blood group incompatibility was found in a lower proportion of these families than in families with normal children. The authors conclude that maternal isoimmunization to the Rh factor plays only a slight role in the etiology of cerebral palsy.

Twin Fetuses in Fetu.—This is a report of a very unusual type of retroperitoneal teratoma, consisting of twin fetuses, occurring in a newborn infant. The infant was admitted to the hospital at the age of two days because of regurgitation and the presence of a fist-sized abdominal mass. Roentgenograms of the abdomen showed a moderate amount of amorphous bone and an almost complete fetal skeleton in the center of the mass. Surgical excision was performed, and the mass was found to consist of two membranous sacs containing two partially developed fetuses. Recovery was complete following operation, and the child developed normally during a three and one-half year observation period. A fetus in fetu does not arise from fertilization of an ovum within a child. Instead it represents a splitting off of cells from a developing embryo, the growth of which produces a teratoma. Complete excision of the entire growth, including the membranes, is essential for cure, since remnants invite local recurrence or metastatic spread. Radiation therapy is not curative in these cases.

Journal of Urology, Baltimore

65:351-496 (March) 1951. **Partial Index**

Multilocular Cysts of Kidney. T. H. Frazier.—p. 351.
Dissecting Aneurysm of Abdominal Aorta Simulating Renal Disease: Case Diagnosed Ante-Mortem. H. A. Kontoff and B. R. Sears.—p. 364.
Diagnosis of Involvement of Inferior Vena Cava in Renal Neoplasms. P. A. Duff and W. H. Granger.—p. 368.
Thrombo-Angiitic Occlusion of Renal Artery with Resultant Hypertension. S. Malisoff and M. B. Macht.—p. 371.
Lymphoblastomatous Nephropathy. C. H. deT. Shivers and H. D. Axilrod.—p. 380.
Cutaneous Metastases from Transitional Cell Carcinoma of Renal Pelvis and Bladder. L. K. Mantell and G. R. Hamilton.—p. 386.
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Exstrophy of Bladder Complicated by Adenocarcinoma. R. Goyanna, J. L. Emmett and J. R. McDonald.—p. 391.
Myosarcoma of Bladder. G. M. Fister and A. J. Lund.—p. 401.
Functional Results Following Transurethral Resection and Retropubic Prostatectomy. H. C. Rolnick and M. A. Robbins.—p. 408.
Retropubic, Extra-Urethral and Extravesical Prostatectomy. H. B. Schwartz.—p. 416.
Osteitis Pubis. E. F. Hock and K. A. Kurtz.—p. 419.
Flaqué-Lowsley Operation for Urinary Incontinence: Preliminary Report. A. Vergés-Flaqué.—p. 427.
Female Pseudohermaphroditism with Supplementary Phallic Urethra: Report of Two Cases. F. S. Howard and F. Hinman Jr.—p. 439.
Paraffinoma of Penis: Case Report. R. H. Bradley Jr. and W. A. Ehrgott.—p. 453.
Carcinoma of Cowper's Gland. W. A. Griesau and D. Lipphard.—p. 460.
Sperm Survival at Estimated Ovulation Time: Comparative Studies in Morphology: Preliminary Report. M. R. Cohen and I. F. Stein.—p. 467.
New Chemical Approach to Dissolution of Urinary Calculi. R. F. Gehres and S. Raymond.—p. 474.
*Penicillium Infection of Urinary Tract. J. S. Gilliam Jr. and S. A. Vest.—p. 484.

Penicillium Infection of Urinary Tract.—This paper concerns the occurrence of a Penicillium mold in man as a pathogen. The patient was an entomologist, 56, who for many years had had episodes of colicky right flank pain, coming on suddenly and sometimes lasting for several days. The pain, usually beginning over the kidney region and radiating down the course of the ureter,

was accompanied by mild fever and malaise and was followed in a few hours by the passage of balls of pink material in the urine. Following this there was a remission of the fever and no further symptoms until the occurrence of another attack, some months later. The attacks seemed to be more frequent in fall and winter. The pink material in the urine was identified by the authors as a large mass of mycelium. Cultures from the kidneys obtained by ureteral catheterization revealed a mold that was present only in the urine from the right side. Pure cultures of the mold were identified as Penicillium citrinum, one of the 200-odd species of Penicillium. There was little evidence that serious kidney damage had occurred from this unusual infection over the past 12 years. There was only moderate reduction in renal function, and the pyelographic evidence of pyelonephritis in the affected kidney was not pronounced. This particular Penicillium produced little if any antibiotic substances on culture. It possibly produced a weak antibiotic in vivo, as the urinary tract had remained sterile. No chemotherapeutic agent has been found to which this fungus will respond. The patient died elsewhere, and cultures taken at autopsy showed Penicillium in the bladder and right kidney.

Kentucky Medical Journal, Bowling Green

49:97-138 (March) 1951

Glomerular Nephritis. L. H. Winans.—p. 97.
Review of Cesarean Section in Small Hospital. S. H. Flowers.—p. 104.
Tracheo-Esophageal Fistula in the New-Born—Surgical Repair. J. R. Bryant.—p. 108.
Cutaneous Blastomycosis. R. L. Cash.—p. 110.
Homologous Serum Jaundice Treated Successfully with Aureomycin. K. L. Lockwood.—p. 116.

49:139-188 (April) 1951

*Vagotomy and Pyloroplasty: Physiologic Treatment for Duodenal Ulcer. H. E. Dorton and J. G. Webb.—p. 139.
Central Serous Retinosis and Its Relation to Other Acquired Impairments of Central Vision. A. H. Keeney.—p. 148.
Chronic Amebiasis: Diagnosis and Treatment. R. A. Radke.—p. 153.
Hemangioma of Ileum with Intussusception. R. H. Weddle.—p. 158.
Perforation of Interventricular Septum Following Myocardial Infarction. B. M. Kaplan, J. H. Mahaffey and H. L. Clay.—p. 161.

Vagotomy and Pyloroplasty for Duodenal Ulcer.—Eighty-five to 90 per cent of patients with duodenal ulcer can be managed satisfactorily by medical measures. In intractable or complicated cases gastric resection yields good results in about 90% of patients. However, Dorton and Webb feel that the mutilating nature of the procedure, together with its magnitude, risk (2 to 3% mortality), and a 5 to 10% incidence of marginal ulceration, justifies the search for a simpler and safer method. They feel that vagotomy combined with pyloroplasty is such a method. They selected pyloroplasty as the drainage procedure to accompany vagotomy for the following reasons: 1. It relieves pylorospasm, which is probably a contributing factor in the production of duodenal ulcer. 2. Pyloroplasty permits direct inspection and local removal of the scarred ulcer area. 3. The approach can be used to control a bleeding vessel. 4. Pyloroplasty has the advantage of Billroth I procedure: anastomotic ulceration cannot occur. 5. Pyloroplasty prevents strictures at the outlet of the stomach as the ulcer heals. It also permits ready emptying of the stomach during the immediate postoperative period, when the stomach is temporarily atonic from the recent gastric neurectomy. 6. Pyloroplasty is much simpler to perform than gastroenterostomy and has a lower morbidity. 7. Pyloroplasty does not alter the basic anatomic arrangement of the stomach. 8. Finally, since pyloroplasty alone will cure only 20% of ulcers, the curative effect of vagotomy would be less obscured than if gastroenterostomy, which cures 70 to 80%, was used. Twenty-two patients with proven intractable or complicated duodenal ulcers were treated by vagotomy and pyloroplasty. Twenty-one (95.4%) of these patients have had excellent results.

Missouri State Medical Assn. Journal, St. Louis

48:161-264 (March) 1951

Coarctation of Aorta: Report of Four Cases Operated upon. C. P. Lynxwiler, S. Smith, J. L. Lucido and J. J. Inkley.—p. 177.
Factors in Psychotherapeutic Success. I. N. Mensh and J. M. Golden.—p. 180.
Streptomycin in Treatment of Pulmonary Tuberculosis: Some General Considerations. P. Murphy.—p. 187.

New England Journal of Medicine, Boston

244:495-536 (April 5) 1951

*Treatment of Chronic Human Amebiasis with Aureomycin. W. H. Hall.—p. 495.
Carcinoma of Bladder: Evaluation of Total Cystectomy and Other Methods of Treatment. F. H. Colby and W. S. Kerr Jr.—p. 504.
Importance of High-Pitched Squeaking Systolic Murmur in Diagnosis of Aortic Stenosis and Calcification of Aortic Valve. H. A. Braun and W. J. Comeau.—p. 507.
*Rickettsialpox in Boston: Report of Case. J. Franklin, E. Wasserman and H. S. Fuller.—p. 509.
Medicine as Science: Microbiology. D. L. Belding.—p. 511.

Aureomycin in Chronic Amebiasis.—In vitro studies demonstrated that aureomycin hydrochloride killed the trophozoites of Endameba histolytica in concentrations as low as 50 γ per cubic centimeter. Although this effect was undoubtedly in part the consequence of an alteration of bacterial flora, there was evidence that aureomycin also directly attacked the amebas. Twenty patients with amebiasis, 10 with chronic amebic dysentery, six amebic cyst passers or carriers, and four with amebic hepatitis or amebic abscess were treated with aureomycin hydrochloride by mouth. The dose given was 0.5 gm. every six hours for 10 days. In the 10 patients with chronic amebic dysentery the parasites usually disappeared from the stools within 24 hr. after the first dose, although, in two patients, 48 to 72 hr. of treatment was required before the parasites disappeared. Seven of the 10 patients remained asymptomatic for three to 14 mo. after treatment was discontinued. One patient had recurrent symptoms, another required two courses of treatment before his symptoms disappeared. In a patient with regional ileitis paralytic ileus developed during aureomycin therapy and required surgical excision of the involved ileum. After 24 to 72 hr. of treatment cysts could no longer be observed in the feces of the six patients who had passed cysts of Endameba histolytica in their feces before treatment. No parasites were found in formed or purged stools of any of these patients for an average of six months after treatment. Only one of the three patients with amebic hepatitis became asymptomatic and free of amebas on stool examination after a single course of aureomycin. One other patient, with liver abscess, showed no symptomatic benefit from aureomycin, although the amebas disappeared from his feces. At present it appears that aureomycin should not be used alone in the presence of hepatic amebiasis but should be supplemented by emetine hydrochloride or chloroquine phosphate or both. No serious toxic effects of aureomycin were noted, although it caused minor gastrointestinal disturbances in several patients.

Rickettsialpox in Boston.—The natural occurrence of rickettsialpox is reported in a housewife, 46, in Boston. The diagnosis was established by the typical clinical and laboratory observations, including a significantly elevated complement fixation titer. Systemic symptoms were noted three days after detection of the primary lesion, an area of induration and erythema with a central black crust on the dorsal surface of the right thenar eminence. Temperature was restored to normal after six days of fever, the highest recorded level reaching 103 F. Severe frontal headache was one of the chief complaints. An irregularly scattered, discrete, slightly erythematous maculopapular eruption over the chest, abdomen, and back appeared on the fourth day after fever was first noted. During both the acute and the convalescent phases of the illness, results of tests for heterophil antibody were negative. The complement fixation titer rose from zero during the acute phase of illness to a level of 1: 320 during convalescence, three weeks after the appearance of the primary cutaneous lesion and 19 days after onset of fever. The patient recovered promptly without specific treatment. This is the second naturally occurring case of rickettsialpox diagnosed in Massachusetts. It probably indicates a second focus of natural infection within the city of Boston.

Oklahoma State Medical Assn. J., Oklahoma City

44:81-122 (March) 1951

Recent Advances in Treatment of Cerebral Thrombosis. W. N. Weaver.—p. 84.
Traumatic Injuries of Thorax. E. Fair.—p. 86.
Carcinoma of Lung. J. W. Gale.—p. 89.
Deep Infection of Neck. R. E. Stuart.—p. 93.
Accidental Electrocution. P. A. Sugg.—p. 97.

Public Health Reports, Washington, D. C.

66:387-422 (March 30) 1951

Potentialities of Biological Warfare Against Man—Epidemiological Appraisal. A. D. Langmuir.—p. 387.
Environmental Health: Critique. M. D. Hollis.—p. 400.

66:423-454 (April 6) 1951

Community-Wide Chest X-Ray Survey: IV. Diagnostic Clinic. D. Reisner and A. Rikli.—p. 423.

66:455-486 (April 13) 1951

Isolation and Characterization of Rocky Mountain Spotted Fever Rickettsiae from Rabbit Tick Haemaphysalis Leporis-Palustris Packard. R. R. Parker, E. G. Pickens, D. B. Lackman and others.—p. 455.
Rabbit-Ear Cage for Bloodsucking Arthropods. P. A. Woke.—p. 464.

Quarterly J. Studies Alcohol, New Haven, Conn.

12:1-166 (March) 1951

Effects of Alcohol on Conflict Behavior in Albino Rat. J. J. Conger.—p. 1.
Mechanism of Action of Tetraethylthiuram Disulfide in Alcoholism: Iron as Antidote for TETD-Alcohol Reaction. J. A. Christensen.—p. 30.
Effect of Tetraethylthiuram Disulfide on Metabolism of Ethyl Alcohol. H. W. Newman and H. V. Petzold.—p. 40.
Estimation of Methyl and Ethyl Alcohol from Current-Voltage Oxidation Curves. W. M. MacNevin and T. R. Sweet.—p. 46.
Role of Psychiatry in Field of Alcoholism: With Comment on Concept of Alcoholism as Symptom and as Disease. H. M. Tiebout.—p. 52.
New Attitudes Toward Alcoholism. L. A. Osborn.—p. 58.
Attic Temperance. A. P. McKinlay.—p. 61.
Group Therapy in Alcoholism: Transcriptions of Series of Sessions Recorded in Outpatient Clinic. R. G. McCarthy.—p. 103.

Rocky Mountain Medical Journal, Denver

48:229-316 (April) 1951

Acute Appendicitis. P. Thorek.—p. 255.
Diagnosis: Psychoneurosis—What Happens Now? J. M. Lyon.—p. 262.
Experiences with Antabuse: Preliminary Report. F. A. O'Donnell, E. J. Brady and R. W. Davis.—p. 268.

Urologic & Cutaneous Review, West Palm Beach, Fla.

55:193-256 (April) 1951

Subcutaneous Urography: Description of New Method Utilizing 70% Urokon and Hyaluronidase (Preliminary Report). J. E. Byrne and W. F. Melick.—p. 193.
Cancer of Prostate Gland: Fourth Interim Report. R. P. Beatty and A. E. Wright Jr.—p. 199.
*Rapid Treatment of Acute Gonorrhea in Males with Oral Aureomycin. L. T. Wright, W. I. Metzger, M. S. Beinfield and others.—p. 203.
Chloromycetin in Treatment of Bacillary Urinary Infections. W. M. Wilson, R. W. Barnes and R. T. Bergman.—p. 206.
"L. E." Cell Phenomenon and in Vitro-Cortisone. T. Cornbleet and F. T. Flood.—p. 208.
Blastomycosis en Plaque. J. C. Sodaro and C. J. White.—p. 209.
Modern Concepts of Rhinoplastic Surgery. W. A. Marmor.—p. 209.
Peculiar Scars of Upper Lid, New Type of Disease in China. A. Fuchs.—p. 213.

Aureomycin in Acute Gonorrhea.—Sixty-three Negro male patients between the ages of 14 and 56 with acute gonorrhea were treated with aureomycin. A single capsule containing 500 mg. of aureomycin was given initially and a second 500 mg. capsule six hours later. The clinical follow-up showed that the course of the disease was strikingly uniform in these patients. Within 24 hr. bacteriologic smears and cultures were negative in most cases, and the thick, purulent discharge had disappeared completely, although some patients still had a thin, watery discharge that was free of gonococci. After 48 hr. the urethral discharge had completely disappeared. Sixty patients (95.2%) with adequate clinical follow-up were cured; that is, there were negative smears and culture and no clinical symptoms. The remaining three patients were therapeutic failures. With the dose used toxic reactions were minimal and high urine levels of aureomycin were obtained, which persisted for at least 48 hr. in three of four patients. The results showed that aureomycin is as effective as penicillin in the treatment of acute gonorrhea. Aureomycin possesses the following advantages: ease of administration; minimal toxicity limited to the gastrointestinal tract; little or no increased drug resistance of the gonococci; beneficial effect in concurrent gram-negative bacterial urinary tract infections sometimes associated with gonorrhea. Aureomycin should be considered one of the agents of choice in the treatment of acute gonorrhea.

Virginia Medical Monthly, Richmond

78:167-222 (April) 1951

Lung Resection for Tuberculosis. F. P. Coleman and H. J. Hancock.—p. 169.
Rehabilitation of Genitourinary Malformations. W. H. Boyce and S. A. Vest.—p. 176.
Early Medicine in the Old Dominion. M. P. Rucker.—p. 181.
Ocular Torticollis: Report of Case. H. G. Preston.—p. 187.
Experiences with New Types of Insulin. T. S. Edwards, F. V. Vance Jr. and H. B. Mulholland.—p. 190.
Complications of Bronchiectasis. J. T. Phillips Jr.—p. 194.

West Virginia Medical Journal, Charleston

47:107-140 (April) 1951

*Duodenal Obstruction in the Newborn. J. O. Rankin.—p. 107.
*Histoplasmosis. H. Fischer, A. R. Marks, J. E. Wilson and R. Hathaway.—p. 114.
Needed: More Blood. K. R. Nelson.—p. 120.
Acute Abdomen. P. Thorek.—p. 122.

Duodenal Obstruction in Newborn Infants.—Five newborn infants with obstruction of the duodenum were operated on during the past year. The obstructing mechanism was extrinsic in three instances and intrinsic in two. Two patients died, one on the 11th postoperative day, and the other, who was operated on twice, died 24 hours after the second operation. The three other patients made an uneventful recovery. Complete obstruction of the duodenum is a fatal condition unless an early diagnosis is made and adequate surgery is instituted. Vomiting, dehydration, and constipation in the newborn, with a distended mass in the epigastrium and a flat hypogastrium should lead the physician to suspect the true diagnosis. Roentgen examination will reveal a dilated stomach and proximal duodenum, with failure of barium to pass into the jejunum at the end of six hours. Intestinal gas patterns will be absent if the obstruction is complete. Proper preoperative and postoperative care, with replacement of fluids, electrolytes, and blood, and the use of antibiotics will definitely influence the mortality rate.

Histoplasmosis.—The first case of histoplasmosis in West Virginia is reported. The patient was a white female aged 21 months. Physical examination revealed moderately enlarged anterior and posterior cervical lymph nodes. Both the liver and the spleen were palpated two fingerbreadths below the costal margin. The temperature was of the spiked septic type. Tuberculin tests gave negative results. Positive cultures of Histoplasma capsulatum were obtained from the feces, throat, and urine before death, making diagnosis possible before autopsy. The mouth was suspected to be the portal of entry. Cultures obtained of a lymph node taken at autopsy showed the pathogenic agent. A histoplasmosis complement fixation test gave positive results in a titer of 32. A lowered total serum protein level was noted. Treatment, including aureomycin therapy, was ineffective.

Wisconsin Medical Journal, Madison

50:325-416 (April) 1951

Surgical Management of Carcinoma of Colon. F. D. Weeks.—p. 346.
Incidence of Amebiasis in Large General Hospital in Wisconsin: Problem of Carrier State. J. M. Lubitz and J. P. Conway.—p. 353.
Vein Stripping Versus Multiple Ligations. J. M. Sullivan and W. F. Merdinger.—p. 357.
Recent Advances in Anesthesiology. S. C. Cullen.—p. 361.
Combined Operations. L. A. Osborn.—p. 365.
Place of Radiation in Treatment of Intracranial Tumors. H. D. Kerr.—p. 377.

Yale Journal of Biology and Medicine, New Haven

23:361-444 (April) 1951

Adrenal-Hyaluronidase Relationship in Infection. G. H. Smith and J. C. Opsahl.—p. 361.
Ailments and Physicians of Dr. Johnson. P. P. Chase.—p. 370.
Circulatory Changes in Chronic Pulmonary Disease: Study of Pulmonary Collateral Circulation. F. D. Gray Jr., P. R. Lurie and R. Whittemore.—p. 380.
Motor Neuron Development in Spinal Cord Following Removal of Alar Plate and Spinal Ganglia. N. K. Mottet.—p. 390.
Unusual Brachial Plexus Formation. A. Chetrick and L. R. M. Del Guercio.—p. 395.
Chorionic Gonadotrophin, ACTH, and Adrenal-Hyaluronidase Relationship. J. C. Opsahl, C. N. H. Long and E. G. Fry.—p. 399.
Action of Penicillin on Growth Response of Gram-Negative Bacillus to Amino Acids and Peptides. S. Simmonds and J. S. Fruton.—p. 407.

FOREIGN

Archives des Maladies du Coeur, Paris

44:193-288 (March) 1951. **Partial Index**

Classification of Anomalies of Pulmonary Artery and Its Branches. A. Castellanos and O. Garcia.—p. 193.
Comparison of Rapidity of Occurrence of Dense Shadows, of Clinical Signs and of Pathological Anatomy in Spontaneous Course of Chronic Peripheral Arteritis. H. Reboul and P. Laubry.—p. 209.
*Results of Ligation of Inferior Vena Cava in 50 Cases of Irreducible Cardiac Decompensation. E. Donzelot, F. d'Allaines, R. Heim de Balsac and others.—p. 239.

Ligation of Inferior Vena Cava.—Ligation of the inferior vena cava was performed on 50 patients with irreducible cardiac decompensation, of whom 38 had mitral lesions, nine had hypertension, two had aortic lesions, and one had myocardial infarction. Ten patients died within the first two postoperative weeks; in four of them the operation was performed as a last resort. The indication for the operation was apparently erroneous in one patient with calcified aortic stenosis and pulmonary edema, and death resulted from accidents in the remaining five patients. Immediate satisfactory results were obtained in 38 of the 40 surviving patients. Orthopnea and nocturnal paroxysmal dyspnea disappeared, but the objective element of the clinical picture were influenced to a lesser degree. Two patients were not benefited by the operation. Of the 38 who were benefited five showed only slight and transitory improvement, while 33 showed significant and more persistent improvement during a follow-up period of four to 17 months. Twenty-one of the 33 patients were able to lead fairly normal lives: seven returned to factory work, five had to make an occupational change, and nine were able to do housework. In all these patients the persistent disappearance of the functional disturbance was the dominant feature. Nine patients died within three to 13 months after the operation, of whom four had been improved by the operation and one had resumed his former occupation. Death resulted from hemiplegia in four, from cardiac decompensation in two, from nephritis in two, and from repeated surgical intervention in one. Ligation of the inferior vena cava is to be considered only a palliative operation, but it may bring about persistent relief. The best results were obtained in patients with definite cardiac decompensation who still responded to rest and cardiotonics, i. e., in patients whose myocardium is still capable of recovery. With improved surgical technique (transperitoneal approach) and with less early postoperative heparinization the mortality rate should decrease. Conservative and surgical treatment do not exclude one another, but the latter may complete the first if performed at a favorable time in carefully selected cases.

Archivos de Pediatría del Uruguay, Montevideo

22:1-84 (Jan.) 1951. **Partial Index**

*Tuberculous Meningitis Cured by Streptomycin. P. Cantonnet Blanch, A. Pérez Scremini and E. Katz.—p. 18.
*Treatment of Purulent Meningitis in Infants Without Use of Intraspinal Route: Results Obtained in Montevideo. J. Bonaba and J. A. Portillo. —p. 33.

Tuberculous Meningitis Cured by Streptomycin.—A boy, 10, in the course of three years after occurrence of primary tuberculous infection successively had tuberculous pleurisy, ascites, and bilateral spread of pulmonary tuberculosis, which were controlled by the administration of dihydrostreptomycin, in a daily dose of 1 gm. up to a total dose of 40 gm. Four months later, the tuberculous meningitis developed. The diagnosis was confirmed by the positive results of cultures and inoculation of the cerebrospinal fluid in animals. The disease was cured by dihydrostreptomycin, given intramuscularly in a dose of 2 gm. daily and, later on, of 25 mg. three times a week, up to a total dose of 372 gm. in six mo. The intraspinal dose was 50 mg. at four day intervals, up to a total dose of 1.80 gm. for the first few weeks of the disease. The drug was well tolerated by the intramuscular route but not by the intraspinal route. Cure has been maintained up to the present (four months after treatment).

Purulent Meningitis in Infants.—Bonaba and Portillo report good results from a combined treatment of sulfadiazine by mouth and penicillin and streptomycin intramuscularly in 28 cases of purulent meningitis. Most of the patients were infants and young children. At the beginning of treatment the daily doses per kilogram of body weight should be 50 mg. of sulfadiazine, 50,000 units of penicillin, and 50 mg. of streptomycin. Further doses should be adjusted to the clinical course of the disease, the changes of the cerebrospinal fluid, and the levels of the aforementioned drugs in the cerebrospinal fluid. In the cases reported there were no complications, sequelae, or deaths. The cerebrospinal fluid promptly returned to normal, and the disease was promptly controlled.

Beiträge zur klinischen Chirurgie, Munich

182:1-128 (No. 1) 1951. **Partial Index**

Rare Mixed Tumor of Kidneys. E. Ungeheuer.—p. 1.
Measuring Chronaxia in Protruded Intervertebral Disk. H. Griessmann. —p. 7.
Results of Treatment of Hypospadias: Experience with Meyer-Burgdorff's Plastic Surgical Method. J. Edelhoff.—p. 15.
*Differential Diagnosis: Gas in Tissues. G. Sättler.—p. 56.
*New Basic Concepts and Points of View Concerning Pathogenesis and Therapy of Urogenital Tuberculosis. A. Gütgemann.—p. 83.

Differential Diagnosis of Gas-Forming Infections.—The following classification of infections associated with gas in the tissues is suggested: infections associated with air introduced by foreign body, abscess containing gas, gas phlegmon, true gas gangrene of muscular tissue, and putrid gangrene associated with gas. Roentgenologic demonstration of gas in the tissues is of considerable aid to early diagnosis and differential diagnosis. Circular translucent areas of gas above a horizontal liquid surface, particularly in the neighborhood of a causative foreign body, are characteristic of an abscess containing gas. A coarse or fine mottled arrangement of air bubbles in the interstitial areas characterize the gas phlegmon, and feathering of the muscular fibers is to be considered as definite proof of gas gangrene. Putrid gangrene with secondary formation of gas is characterized by a more spongelike structure. There is not always a sharp transition between the roentgenologic picture of putrid gangrene and that of true gas gangrene, mainly because the two frequently occur together. The roentgenologic picture is also an aid in the exact localization of gas gangrene in cases in which proximal to the origin of the gas formation the blood supply of still healthy tissue has been stopped by the diffusion of gas under high pressure. In addition, roentgenography may be helpful in revealing gas gangrene in the deep tissues in the absence of clinical signs. Roentgenologic examination, therefore, should be performed in all doubtful cases.

Urogenital Tuberculosis.—According to Gütgemann, tuberculosis of the urinary system is to be considered frequently as an intermediate stage in the course of generalized tuberculosis. Insufficient consideration of the general condition of resistance, the phase of the disease, and the stage of the tuberculous changes of the tissues are the reasons why definite recovery frequently is not obtained with nephrectomy. Early nephrectomy is still indicated when the tuberculous kidney constitutes a predominant focus, with extensive destruction of its parenchyma and loss of function, thus becoming the starting point of a progressive tuberculosis of the urogenital system. Surgical intervention is not advisable when (1) postprimary tuberculosis is still developing, (2) there is late primary infection with a rapid course, (3) hematogenous dissemination has occurred only recently, (4) there is the possibility of the subsequent occurrence of destructive foci on the as yet uninvolved side, and (5) resistance is not yet consolidated or there is progressive tuberculosis of other organs. Preparatory medical treatment is required in all these cases as well as in those of recent exudative tuberculosis of the kidney. It is imperative to reduce the exudative parenchymatous tuberculosis to a productive-fibrous phase by conservative helio-aerotherapy and to use surgical treatment only after the general resistance has improved and the unilaterality and destructive form of the focus has been established. On the other hand, early nephrectomy is indicated in patients with

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

symptoms on one side only, progressive destruction of parenchyma, toxic lesions of the other kidney, rapidly progressive course of tuberculosis of the bladder and the genital organs, mixed infections, intermittent obstruction and closed pyonephrosis, small focus on the other side, and severe bacilluria. Nephrectomy is less urgent in cases in which a purely parenchymatous nondestructive form of renal tuberculosis may be suggested by mild bacteriuria and albuminuria; in tuberculous nephritis, and in patients with small papillary foci, mild pyuria, good renal function, and no cystitis. Foci in the male genital organs deserve greatest consideration and simultaneous treatment, but radical intervention is indicated only for caseating, disintegrating and disseminating unilateral foci in the seminal vesicles and in the prostate.

British Journal of Dermatology, London

63:123-164 (April) 1951

Vitamin A in Some Congenital Anomalies of Skin. A. D. Porter.—p. 123.
Tylosis Palmaris et Plantaris: Report of Case with Some Unusual Features. I. Anderson.—p. 127.
Basic Concepts in Production and Management of Psychosomatic Dermatoses—II. F. E. Cormia.—p. 129.

British Journal of Ophthalmology, London

35:125-188 (March) 1951

Hyaline Infiltration of Eyelid. N. Ashton and A. Rey.—p. 125.
Brightness Perception and Binocular Adaptation. M. Pugh.—p. 134.
Retinal Changes in Coarctation of Aorta. K. O. Granström.—p. 143.
Phosphatase Activity in Ocular Tissues. J. L. Reis.—p. 149.
Aureomycin Borate in External Ocular Conditions. R. J. McWilliam and T. Wilson.—p. 153.
Vascularization of Cornea. J. H. Doggart.—p. 160.

British Journal of Urology, Edinburgh

23:1-96 (March) 1951. **Partial Index**

Aberrant Artery—Its Division or Conservation in Hydronephrosis. A. W. Adams.—p. 6.
Biopsy of Intra-Ureteral Tumours by Endoscopic Means. N. W. Roome, R. H. Flett and C. M. Spooner.—p. 23.
Case of Hermaphroditism. J. D. Fergusson.—p. 29.
Case of Ganglio-Sympatheticoblastoma of Testis in Infant. G. Smith. —p. 39.
Semen Analysis in Cases of Tuberculous Prostato-Vesiculitis and Its Importance for Indications of Prophylactic Vasectomy. O. Obrant. —p. 46.
Two Extreme Forms of Autonephrectomy in Renal Tuberculosis. J. Fischmann.—p. 52.
Fournier's Gangrene. D. Ebrill and M. O'Donoghue.—p. 56.
Stone Formation in Urethra: Report of Two Cases. G. W. V. Greig. —p. 60.

British Medical Journal, London

1:653-714 (March 31) 1951

*Penicillin-Resistant Subacute Bacterial Endocarditis Treated by Combination of Penicillin and Streptomycin. J. E. Cates, R. V. Christie and L. P. Garrod.—p. 653.
Clinical Trials of A. C. T. H. in Haemolytic Anaemia. L. S. P. Davidson, J. J. R. Duthie, R. H. Girdwood and R. J. G. Sinclair—p. 657.
Effect of A. C. T. H. and Suprarenal Extract on Bone Marrow. J. M. Yoffey, W. K. Metcalf, G. Herdan and V. Nairn.—p. 660.
*Sympathectomy for Hypertension. S. M. Chris.—p. 665.
Effects of A. C. T. H., Cortisone and D. C. A. with Ascorbic Acid on "Formalin-Arthritis." M. W. Parkes and F. Wrigley.—p. 670.
Acute Perforation of Gastro-Duodenal Ulcer Treated Conservatively. E. Scott.—p. 675.
Macrocytic Anaemia. G. Allen and C. F. Critchley.—p. 677.

Penicillin-Resistant Bacterial Endocarditis.—This is a report of four patients with subacute bacterial endocarditis due to penicillin-resistant organisms (Streptococcus faecalis in three and Str. viridans in one). Several types of therapy were tested in each patient. Separate courses of streptomycin and of aureomycin in two patients and of chloramphenicol in a third were all unsuccessful. A combination of penicillin and aureomycin failed to control the fever in one and produced toxic symptoms in another. In three the infection was apparently controlled by a combination of 20 million units of penicillin and 4 gm. of streptomycin daily for at least six weeks. One of these patients died later from heart failure; the other two are alive and well, except for vestibular damage. The fourth patient died from heart failure on the fifth day of treatment, and, although clinical response was prompt, necropsy indicated that infection had not been eliminated. Previously this patient had relapsed after smaller dosages of penicillin and streptomycin given together. The infecting organism was highly resistant to streptomycin. In vitro, the bactericidal action of penicillin on the two organisms so tested was accelerated by the addition of streptomycin and retarded by the addition of aureomycin. In one patient tooth extraction during the prophylactic use of 2 million units of penicillin daily for six days was followed by subacute bacterial endocarditis due to a penicillin-resistant organism.

Sympathectomy for Hypertension.—Since 1945, 35 patients with severe essential and malignant hypertension have been treated by thoracolumbar sympathectomy at Hammersmith Hospital. All these patients met the following criteria: (1) age under 55 years, (2) blood pressure over 200/100 mm. of mercury, with diastolic pressure capable of being reduced at least 20 mm. of mercury by bedrest or sedation, (3) symptoms referable to hypertension present, (4) renal function adequate, (5) cardiac function compensated, and (6) residual disability from any previous cerebral vascular accident absent. Transpleural sympathectomy was performed with resection of the splanchnic nerves and of the ganglionic chain from the sixth thoracic ganglion to the first lumbar ganglion inclusively. Follow-up studies two to 51 months (average 18 months) later revealed that only 25% of the patients had maintained a significant fall in blood pressure but that 66% of them had been relieved of incapacitating symptoms and had returned to work. The author concludes that sympathectomy improves the prognosis of malignant hypertension and is a valuable procedure for a limited but definite group of patients with hypertension.

1:715-772 (April 7) 1951

Taking of Census, 1801-1951. A. J. Taylor.—p. 715.
Medical Significance of Census. W. P. D. Logan.—p. 720.
Sleep Problems in the First Three Years. R. S. Illingworth.—p. 722.
Treatment of Hydrofluoric Acid Burns. R. H. Dale.—p. 728.
Two Types of Diabetes Mellitus, With and Without Available Plasma Insulin. J. Bornstein and R. D. Lawrence.—p. 732.
Sex Pattern and Size of Family. M. H. Thomas.—p. 733.
Blood Flow in Gout. A. J. Barnett.—p. 734.
*Poliomyelitis and Diphtheria Immunization in Belfast. W. J. McLeod. —p. 736.
Anti-Trachoma Campaign in Gozo. V. Tabone.—p. 738.

Poliomyelitis and Diphtheria Immunization.—During an epidemic of 98 cases of poliomyelitis in Belfast an attempt was made to correlate the site of paralysis with previous inoculations of diphtheria toxoid. All but 10 of the 98 children showed paralysis. In two children poliomyelitis developed within one month after immunization against diphtheria. One of them was injected with 0.5 cc. of alum-precipitated toxoid in the right hip, and paralysis of the right leg developed after eight days. The other patient received 0.5 cc. of purified diphtheria toxoid, alum-precipitated, in the left arm, and facial paralysis developed 23 days later. In three children poliomyelitis developed within one to three months after the immunization against diphtheria. These patients had had injections in the arm, but paralysis did not develop in the arms in which injection was made, two of the patients having facial paralysis and the third having paralysis of both legs. In the 28 children in whom paralysis developed more than three months after inoculation, the injection, with one exception, had been given in the arm. In this group paralysis affected the arms less than the legs. In a group of uninoculated children under 2 years of age, paralysis affected the arms almost as frequently as the legs. This is in contrast to the usual preponderance of leg paralyses and shows the spontaneous variations in the site of involvement. An association between site of inoculation and site of paralysis was not observed after 6,250 inoculations of purified diphtheria toxoid, alum-precipitated, in children aged less than 9 years affected by the poliomyelitis epidemic. This limited experience does not prove that the site of inoculation and the site of paralysis in poliomyelitis are unrelated, but the author's experience suggests that purified diphtheria toxoid, alum-precipitated, is a relatively inocuous antigen as far as induction of poliomyelitis in the inoculated limb is concerned.

Edinburgh Medical Journal

58:1-42 (Jan.) 1951

Certain Aspects of Portal Hypertension. J. Learmonth.—p. 1.
Colonic Pain and Colon Neurosis. C. Seward.—p. 17.
Thiacetazone in Pulmonary Tuberculosis. J. H. R. Ramsay.—p. 29.

Giornale di Clinica Medica, Parma

32:133-248 (Feb.) 1951. **Partial Index**

*Significance of Hyperaminoacidemia in Hypoproteinemia. G. Labo' and T. Franco.—p. 133.
*Lack of Potassium, "Determining Factor" of Cardiovascular Insufficiency in Diabetic Coma. A. M. Bertolini and L. Scapellato.—p. 173.

Aminoacidemia in Hypoproteinemia.—Labo' and Franco determined the amount of amino acids in the blood of 25 patients with grave hypoproteinemia complicating different diseases. The level was high in all cases. Often the figures were twice the normal values. The test was repeated when hypoproteinemia diminished or increased. The amino acid level varied inversely as the concentration of proteins in the blood. The deaminizing power of the liver was tested in 15 patients and in 10 controls by the intravenous injection of 100 cc. of a 5% casein enzymatic hydrolysate solution. This power of the liver was normal in eight of the hypoproteinemic patients and diminished in seven. In the latter it became normal when the proteins in the blood became normal. In six patients disturbances in the metabolism of iron and vitamin B_{12} paralleled the course of hypoproteinemia. This suggests that (1) hyperaminoacidemia in hypoproteinemia is due to disorders of the cellular respiratory enzymes, either independent of, or secondary to hypoproteinemia and (2) that the changes in the velocity of deamination in the liver are due to enzymatic disorders and not to liver insufficiency.

Hypopotassemia in Diabetic Patients in Coma.—According to Bertolini and Scapellato, intractable shock, which often follows diabetic coma controlled by insulin, is due to lack of contractility of the myocardial fibrils from insufficiency of serum potassium. The authors emphasize the importance of serum potassium in regulating muscular contraction and point out the causal factors of hypopotassemia in the course of diabetic coma. As proof of the role of hypopotassemia in this condition they cite the typical myocardial lesions from hypopotassemia reported in the literature, the regression of electrocardiographic changes in diabetic coma following the administration of potassium, and the control of diabetic coma by the administration of potassium.

Journal of Bone and Joint Surgery, London

33B:1-146 (Feb.) 1951

Protrusions of Lumbar Intervertebral Discs: Clinical Review Based on 500 Cases Treated by Excision of Protrusion. J. E. A. O'Connell.—p. 8.
Causes of Unsatisfactory Results from Operative Treatment of Lumbar Disc Lesions. J. R. Armstrong.—p. 31.
Pseudarthrosis of Tibia in Childhood. B. McFarland.—p. 36.
Note on Pseudarthrosis of Tibia in Childhood: Discussion Arising from Preceding Paper, with Some General Observations on Healing of Fractures. A. N. Birkett.—p. 47.
Congenital Posterior Bowing of Tibia with Talipes Calcaneo-Valgus. B. F. Miller.—p. 50.
Manubrio-Sternal Joint in Ankylosing Spondylitis. D. L. Savill.—p. 56.
Monteggia Fracture with Posterior Dislocation of Radial Head. J. H. Penrose.—p. 65.
Some Experiences in Treatment of Osteomyelitis of Infants: Evaluation of Results of Treatment by Penicillin. C. N. Athanassiadis.—p. 74.
Osteochondromatosis of Hip Joint. R. Bloom and J. N. Pattinson.—p. 80.
Osteochondromatosis of Hip Joint: Report of Case. G. Hamada.—p. 85.
Intrathoracic Meningocele, Spinal Deformity, and Multiple Neurofibromatosis. A. W. Lipmann Kessel.—p. 87.
Causative Mechanism in Morton's Metatarsalgia. J. D. Mulder.—p. 94.
De Quervain's Disease. B. Keon-Cohen.—p. 96.
Diaphysial Aclasis: Report of Unusual Case. V. H. Ellis and J. G. Taylor.—p. 100.
Cavernous Haemangioma of Knee Joint: Report of Case. A. H. Hunt and I. P. Todd.—p. 106.
Atlanto-Axial Fracture-Dislocation: Report of Case. G. O. Tippett.—p. 108.
First Recurrence of Osteomyelitis 80 Years After Infection. W. E. Gallie.—p. 110.
Disruption of Pelvis: Report of Case. T. F. Rose.—p. 112.

Journal of Hygiene, London

48:397-528 (Dec.) 1950

Rapid Detection of Mycobacterium Tuberculosis by Microscopic Examination of Milk from Individual Cows and from Groups of 10 Cows. M. L. C. Maitland.—p. 397.
Statistical Control in Haematology. H. O. Lancaster.—p. 402.
Alkali-Dissolved Diphtheria Toxoid-Antitoxin Floccules Adsorbed on Aluminum Carriers: Preparation, and Immunity Experiments in Animals. J. H. Mason.—p. 418.
Repeated Re-Use of Sea Water as Medium for Functioning and Self-Cleaning of Molluscan Shellfish. L. A. Allen, G. Thomas, M. C. C. Thomas and others.—p. 431.
Experimental Study of Haemolytic Disease of Newborn Due to Isoimmunization of Pregnancy: II. Report of Attempt to Produce Anti-Red Cell Isoantibodies in Guinea Pigs, Together with Note on Blood Picture of One-Day Old Guinea Pigs. L. S. Mynors, D. H. Heard and R. R. A. Coombs.—p. 458.
Human Tuberculosis of Bovine Origin in Northern Ireland. L. V. Reilly.—p. 464.
Infantile Gastro-Enteritis with Special Reference to Specific Serological Type 0 55 B5 H6 (Beta Type) of Bacterium Coli. J. Smith, W. H. Galloway and A. L. Speirs.—p. 472.
Conglutination Phenomenon: VII. Study of Interaction of Complement Components and Conglutinin in Process of Conglutination. R. R. A. Coombs, A. M. Blomfield and G. F. Roberts.—p. 484.
Brucella Bacteriophage. M. J. Pickett and E. L. Nelson.—p. 500.
Detection of Streptococci in Air. R. E. O. Williams and A. Hirch.—p. 504.

Journal de Médecine de Lyon

32:303-350 (April 5) 1951. **Partial Index**

Respiratory Paralysis in Acute Infections of the Nervous System. P. Sédallian, A. Bertoye, R. Maral and others.—p. 305.
Gastric Dilatation Due to Vagal Paralysis in Poliomyelitis. P. Sédallian, R. Maral, C. Exbrayat and others.—p. 321.
*Development of Paralysis in Two Stages in Heine-Medin Disease. P. Sédallian and L. Gaillard.—p. 331.
*Should Routine BCG Vaccination be Practiced in Newborn Infants? H. Pigeaud, G. Despierres and A. Sabot.—p. 335.

Paralysis in Two Stages in Poliomyelitis.—In about 5% of the cases of poliomyelitis, paralysis may develop in "two stages," i. e., new peripheral paralyses may develop within eight days to one month after the first appearance of paralysis and may be localized in parts of the body not previously involved. The authors recently observed five cases of this type. One was that of an adolescent, 17, with flaccid quadriplegia and definite meningeal syndrome. Within one month, when the acute phenomena had disappeared and the patient was able to move his lower extremities somewhat, he experienced an attack of bulborespiratory type with tracheobronchoplegia and paralysis of the intercostal muscles and of half of the diaphragm. These symptoms subsided partially, and the patient survived. A second patient, 15, with flaccid quadriplegia and total respiratory paralysis, had been placed in a mechanical respirator for two months, when suddenly he presented a paralysis of the hypoglossal nerve followed by fatal coma. The authors' five patients were treated with convalescent serum and large doses of pteroylglutamic acid (folic acid); they were also given roentgen irradiation of the spinal cord, and two of them received large doses of cortin. None of this therapy prevented the "second stage" of paralysis. In most of the patients of this type reported on in the literature, the upper levels of the spinal cord were involved. Seventy-six per cent of the patients had severe quadriplegia or respiratory paralysis or both. Intercurrent infections, such as chickenpox and infectious pulmonary complications, in patients with respiratory paralyses seem to predispose to this particular type of paralysis. The pathogenesis remains doubtful. Although the possibility of a relapse or a second attack may be considered, one must admit that the virus is capable of persisting in the nervous system of certain patients with poliomyelitis or of reinfecting the organism by the endogenous route. Weakened resistance due to intercurrent infection and prolonged presence of the virus in the fecal matter may play some part.

Routine BCG Vaccination of the Newborn.—In the course of the first six months of 1950, BCG vaccination was given to 650 infants in a maternity ward. Only premature infants whose weight was less than 5 lb. (2,267.96 gm.) and those whose mothers refused vaccination were not vaccinated. Within six weeks after the vaccination 361 of the 650 infants were sub-

jected to a skin test, and the reaction to it was positive in 97.78%. Six months later a control test could be performed on only 154 children. The cutaneous reactions were positive in all the children, including two who had negative reactions to the first test. Thus the purpose of the vaccination, to induce the appearance of a cutaneous allergy, was fully achieved. Significant reactions in the lymph nodes in the vaccination area occurred in only eight children. "Becegitis" is the term that was coined for this accident. Recovery without fistulization occurred in four instances, and fistulization occurred in three, in one of which Koch's bacillus was demonstrated. A large left carotid lymph node was observed in the eighth child. An incision was made, and pus was removed that resembled the pus of a cold abscess. The lymph nodes in the right subclavicular region and those in the right masseter muscle were also enlarged. There was a highly positive reaction to a repeated skin test. The child took a downhill course and died. Koch's bacillus could not be demonstrated. Accidents of this type were never observed in adults. Since a regular follow-up of the vaccinated children during the first years of life is not possible practically although it is imperative, the authors doubt the expediency of routine BCG vaccination in newborn infants in a maternity ward, not so much because of the risks involved, which are minimal, but because of the danger of discrediting an excellent method of prophylaxis, the systematic employment of which should be limited to adolescents and adults who still have negative reactions to tuberculin skin tests, and to children in the school age.

32:351-396 (April 20) 1951. **Partial Index**

*Bacteriologic Dependence on Streptomycin and Clinical Exacerbations Due to Streptomycin. A. Dufourt, J. Brun, J. Viallier and J. C. Kalb. —p. 351.
Cardiovascular Disturbances from Acute Carbon Monoxide Poisoning: Report of Case of Syphilitic Aortitis with Sudden Decompensation of This Origin. R. Froment, H. Fraisse and P. Fourier.—p. 357.
*Thirty-Five Cases of Brucellosis Treated with Aureomycin. M. Y. Mazaré and O. Bertheas.—p. 375.

Bacteriologic Dependence on Streptomycin.—Five patients between 25 and 45 with tertiary pulmonary tuberculous lesions are reported on. In four of these patients two distinct successive clinical phases were observed during treatment with streptomycin. In the first phase, which varied in duration, the condition of the patients improved with administration of streptomycin. During the second phase the condition of the patients became worse when the drug was given, and their tuberculous lesions progressed rapidly. In this stage the tubercle bacilli showed in vitro a relative dependence on streptomycin: instead of being inhibited by the antibiotic, they grew more abundantly and more rapidly when streptomycin was added to the Youmans medium. In one patient the first course of treatment produced an exacerbation of his condition, and an absolute dependence of Koch's bacillus on streptomycin was demonstrated in vitro: the bacillus could be isolated in Youmans medium only when streptomycin was added. In this patient the two clinical phases that were observed in the four other patients could not be differentiated, because of the rapid development of the bacterial dependence in the ulcerative-caseating lesions within three weeks. Resistance to streptomycin when once acquired is permanent, but dependence is temporary, and the strains may lose their dependence more or less rapidly, provided that contact with the antibiotic is discontinued. For long periods of time bacterial resistance may not be associated with dependence, despite continued treatment with streptomycin. Bacterial resistance to streptomycin observed in vitro is to be considered a danger signal, which requires immediate discontinuation of treatment. Sputum cultures should also be made then, since resistance to streptomycin may quickly be followed by dependence. Paraaminosalicylic acid given by mouth and continued administration of streptomycin in effective doses frequently but not always prevents resistance. The authors advise against alternative courses of treatment with paraaminosalicylic acid and streptomycin and against isolated or repeated courses of treatment with 20 to 40 gm. of streptomycin alone, which they consider as a definite means of building resistance of the bacilli to the antibiotic. Intramuscular administration of a total dose of 80 to 120 gm. of streptomycin combined with oral administration of paraaminosalicylic acid given by mouth in daily doses of 15 to 25 gm. is recommended.

Aureomycin in Brucellosis.—Thirty-five patients, 22 men, 11 women, and 2 children, with brucellosis were treated with aureomycin on a daily dose of 0.10 to 0.25 gm., which was increased gradually to a maximum of 2 to 3 gm. in adults and maintained for two weeks. The total dose varied from 24 to 55 gm. Clinical recovery was rapid and spectacular in 33 patients. Headache subsided within four to five days, the spleen became smaller within 10 days, and myalgia and arthralgia disappeared within 15 days. The patients were apparently cured within 15 to 20 days. Two patients were therapeutic failures. Untoward reactions to the drug consisted of nausea, vomiting, pruritus ani, and malaise but were never so severe that discontinuation of treatment was required. Late results of treatment were less satisfactory than early results. Of 22 patients, nine who had been followed up for one to eight months made a complete and definite recovery. In two patients symptoms reappeared in an attenuated form after the patients' discharge from the hospital and persisted for three weeks, to be followed by recovery, which then was maintained for four and seven months respectively. Eleven patients had true recurrences, with refractory symptoms requiring repeated hospitalization in three instances. The authors believe that aureomycin induces improvement rather than a definite cure of brucellosis. Prognosis is more favorable in young patients, provided that large doses (4 gm. daily from the start of the treatment) may be administered for 30 days (total dose 120 gm.) and that treatment is instituted early. The systematic combination of aureomycin therapy with vaccine therapy seems to be justified.

Journal of Mental Science, London

97:259-440 (April) 1951. **Partial Index**

Priscol in Circulatory Deficiency. L. D. Gardner.—p. 278.
Childhood Schizophrenia and Mental Deficiency. B. W. Richards.—p. 290.
Mental Diseases Peculiar to Certain Cultures: Survey of Comparative Psychiatry. P.-M. Yap.—p. 313.
Loss of Written Language Due to Dissolution of Phonetic Structure of Word in Brain Abscess. R. Klein.—p. 328.
Permeability of Blood-Brain Barrier to Penicillin in Cases of Parenchymatous Neurosyphilis. R. H. F. Smith.—p. 340.
Fifty Cases of Epilepsy Treated with "Tridione." J. Hoenig.—p. 362.
Desoxycortone Acetate and Ascorbic Acid in Treatment of Schizophrenia. L. Rees and G. M. King.—p. 376.
*Account of E. C. T. Given to Patient with Tantalum Plate in His Skull. H. Osmond.—p. 381.

Electric Convulsion Therapy with Tantalum Plate in Skull.—This is the first report of electric shock therapy in a patient with a metal plate in his skull. The patient was a man, 30, with a depressive state following severe head injury. Skull x-ray plates showed a large metal plate in the left frontoparietal region and a retained metallic fragment in the vault near the right border of the plate. There was some doubt as to what might happen if electroshock therapy were given to a patient with a tantalum plate in his head, but the patient agreed to the treatment and 7 electric convulsion treatments were given without untoward effect. Complete recovery ensued. The author believes that there will not be many cases like this one; but with the increase of extensive brain surgery it is possible that from time to time other patients will be seen for whom electric convulsion therapy might be withheld because of doubts about its safety, when, if given, it would perhaps produce speedy relief.

Journal Neurol., Neurosurg. & Psychiatry, London

14:1-58 (Feb.) 1951

Projection of Olfactory Epithelium on Olfactory Bulb in Rabbit. W. E. Le Gros Clark.—p. 1.
Observations on Passage of Weed's Prussian Blue Mixture Along Axis Cylinders and Inter-Fibre Fluid of Nerves. E. J. Field.—p. 11.
Method of Measuring Reflex Times Applied in Sciatica and Other Conditions Due to Nerve-Root Compression. D. S. Malcolm.—p. 15.
Arteriography and Carotid Artery Ligation in Intracranial Aneurysm and Vascular Malformation. I. S. Wechsler, S. W. Gross and I. Cohen. —p. 25.
Disability Caused by Brain Wounds: Review of 1,166 Cases. W. R. Russell.—p. 35.
Visual Field Defects in Subacute Combined Degeneration of Spinal Cord. G. H. H. Benham.—p. 40.
Investigation into Effects of Glutamic Acid on Human Intelligence. J. R. Milliken and J. L. Standen.—p. 47.

Lancet, London

1:647-698 (March 24) 1951

*Risks of Gastroscopy: Survey of 49,000 Examinations. F. A. Jones, R. Doll, C. Fletcher and H. W. Rodgers.—p. 647.
Accidental Perforation During Gastroscopy. T. H. Boon.—p. 651.
General Anaesthesia for Gastroscopy. J. C. Goligher and H. L. Thornton.—p. 652.
Use of High-Frequency Ultrasonic Waves for Detecting Changes of Texture in Living Tissues. J. J. Wild and D. Neal.—p. 655.
Aplastic Anaemia: Review of 27 Cases. E. B. Adams.—p. 657.
Effect of A. C. T. H. in Acute Dermatomyositis. M. M. Suzman and J. A. Rudolph.—p. 660.
Controlled Hypotension and Postural Ischaemia to Reduce Bleeding in Surgery: Review of 250 Cases. G. E. H. Enderby and J. F. Pelmore.—p. 663.
Use of Pentamethonium and Posture to Reduce Bleeding in Fenestration Operations. G. Hughes.—p. 666.
*Influence of Androgens on Sexuality in Women. G. L. Foss.—p. 667.

1:699-752 (March 31) 1951

Evaluation of Public-Health Measures for Control of Syphilis: Epidemiologic Study. J. E. Moore.—p. 699.
Intramedullary Nailing in Recent Fractures of Femoral Shaft. G. C. Lloyd-Roberts.—p. 711.
Diphtheria Antitoxin in Cord-Blood: Survey of Samples from 15 Areas of British Isles. M. Barr, A. T. Glenny and H. J. Parish.—p. 713.
Post-Traumatic Epidermoid Cysts. F. Young.—p. 716.
Estimation of Alkali Reserve: Method for Routine Hospital Use with Small Amounts of Plasma. H. Lehmann.—p. 718.
Human Infection with Virus of Contagious Pustular Dermatitis. G. M. Lloyd, A. Macdonald and R. E. Glover.—p. 720.
Experimental Nystagmus. R. C. Browne.—p. 721.

Risks of Gastroscopy.—The risks associated with gastroscopy were assessed by means of a questionnaire sent to 40 gastroscopists. Seventy-five accidents with 32 deaths were reported following 49,000 gastroscopies. Five additional accidents with three deaths were reported, but the corresponding number of gastroscopies was not known. Fifty-four, i. e., two-thirds of the accidents were perforations of the esophagus, which usually occurred in the upper esophagus or hypopharynx with the use of the Hermon Taylor gastroscope. Most of them occurred in women over 50, and the risk in this age and sex group was estimated to be nine or 10 times that in men over 50 and in younger women, and 30 times that in younger men. It is recommended that the Wolf-Schindler gastroscope be used routinely for gastroscopy in elderly women and in all outpatients. An appreciable number of accidents occurred with both the blunt metal and the rubber fingertips; it could not be determined which was safer. Since the introduction of penicillin a significant proportion of patients with esophageal perforations have recovered on medical treatment. Conservative treatment should be tried in mild cases, but when a gross leak is apparent or there is perforation of the lower esophagus immediate suture should be performed. Perforation of the stomach has been rare following the abandonment of the rubber sponge tip; when it occurs it may be treated medically. Six reactions to the anesthetic were reported, five of which were fatal. Of the deaths, four were atributable to overdosage. Four cubic centimeters of 2% tetracaine (pontocaine®) hydrochloride should be the maximum used as a local surface anesthetic. Owing to the definite risk attached to gastroscopy the indication for each examination should be clearly defined.

Influence of Androgens on Sexuality in Women.—Ten women between 37 and 63 with advanced metastases from cancer of the breast were treated with massive doses of testosterone propionate in oil. The doses varied between 200 and 300 mg. daily for several weeks until improvement occurred or the patient was obviously not benefited and was deteriorating rapidly. In those in whom clinical improvement was observed, the doses were gradually reduced in amount and frequency. An abnormal increase in sexual desire was recorded in those patients who had shown temporary clinical improvement. These observations confirm those of other workers on the effect of androgens on sexual behavior in female patients and are in accord with the experiments of Klein on animals. It is suggested that sexual behavior in women may normally depend more on suprarenal androgens than on estrogens.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

95:593-656 (Feb. 24) 1951. **Partial Index**

*Influence of Injections of Testosterone on Primary Chronic Polyarthritis. K. W. Kuipers.—p. 611.
Combined Surgical and Injection Therapy in Varicose Saphenous Vein: Experiences in 556 Cases. J. S. van Coevorden.—p. 619.

Injections of Testosterone in Polyarthritis.—Kuipers points out that the earlier trials with hormone therapy in arthritis may be regarded as forms of steroid therapy. He mentions among others his report with Touw in 1938 on the use of progestin in primary chronic polyarthritis. He briefly discusses the use of pituitary adrenocorticotropic hormone and of desoxycorticosterone acetate together with vitamin C. This report concerns chiefly the results obtained with testosterone propionate. All the 20 patients treated with this hormone were men who had typical chronic polyarthritis with changes in the joints, muscular atrophies, "glossy skin," subfebrile temperatures, poor general condition, and increased erythrocyte sedimentation rate. The average duration of symptoms was three years and the patients had been subjected to other therapeutic measures before this treatment was begun. Testosterone propionate in oil was injected into the gluteal muscle in doses of 75 or 100 mg. twice each week. Patients showing no effects after six to eight injections were sometimes given doses of 200 to 250 mg., but after two such doses the usual 100 mg. doses were resumed. Doses were reduced to one a week in those showing improvement. This treatment proved effective in 10 of the 20 patients. The author feels that further trials with this treatment are justified.

95:657-760 (March 3) 1951. **Partial Index**

*Hemorrhagic Diathesis as Symptom of Carcinoma. J. Zeldenrust.—p. 679.
Tuberculous Pleurisy and Pulmonary Tuberculosis. B. van Vliet.—p. 684.
*Peptic Ulcers in Aged Persons. J. ten Kate.—p. 689.

Hemorrhagic Diathesis as Symptom of Carcinoma.—In two women, 51 and 49, respectively, signs of hemorrhagic diathesis appeared, with thrombopenia as the most significant hematological change. Both patients died, one about six weeks and the other about two months after the first appearance of the cutaneous hemorrhages. Necropsies disclosed carcinoma of the ovary in one and of the stomach in the other woman. In both cases the carcinoma had metastasized into the bone marrow. There had been no other signs of carcinoma, before the hemorrhagic diathesis appeared.

Peptic Ulcers in Aged Persons.—On the basis of case histories of seven patients, who ranged in age between 73 and 79, the clinical aspect of peptic ulcer in aged persons are discussed. These patients did not have a long history of ulcer symptoms, the duration in the reported cases ranging from a few days to four months. In four of these patients hemorrhages occurred, and in one perforation resulted. Vascular sclerosis is probably an important factor in this type of peptic ulcer. The short duration of symptoms and the roentgenologic aspects often suggest carcinoma. When carcinoma is suspected or when hemorrhages occur, surgical treatment is advisable. Five of the seven patients here discussed were subjected to resection; in one a gastroenterostomy was done, and in one the perforation was closed. All recovered.

Nordisk Medicin, Stockholm

45:301-342 (Feb. 28) 1951

Ulcer of Leg—Problem in Medicine? O. Gilje.—p. 301.
*PAS and Streptomycin in Surgical Treatment of Pulmonary Tuberculosis. G. Birath, T. Bruce, C. Crafoord and L. G. Uggla.—p. 306.
Resection of Lung in Tuberculosis. P. Vaksvik.—p. 310.
Tests of Disinfection of Tubercle Bacilli. E. Bengtsson.—p. 312.
Renal Venous Thrombosis. R. Wichmann.—p. 316.
Barium Intoxication. S. Aarseth.—p. 318.

PAS and Streptomycin in Surgical Treatment of Pulmonary Tuberculosis.—Birath and his associates state that their comparative analysis in 1948 of the value of paraaminosalicylic acid and streptomycin respectively in connection with surgical treat-

ment of pulmonary tuberculosis testifies to the importance of more consistent chemotherapy. Chemotherapy permits surgical treatment in patients not previously operable. In 1949 preoperative treatment with paraaminosalicylic acid was given to 73 patients, streptomycin to 12 patients, and combined paraaminosalicylic acid and streptomycin to 25. Many advanced cases were included. Surgical treatment was performed as planned in 107 cases, and after four months there are residual cavities in eight patients and spread in three. During operative and postoperative treatment the number of patients who received combined paraaminosalicylic acid and streptomycin was increased to 50. Systematic preoperative treatment starting, as a rule, with paraaminosalicylic acid is recommended. Streptomycin should be reserved for use when the effect of paraaminosalicylic acid is not fully satisfactory or for complications following operation, when it should be given in combination with paraaminosalicylic acid.

Nordisk Medicin, Stockholm

45:343-382 (March 7) 1951

Tapeworm Problem in Finland. O. Vartiainen.—p. 343.
*Symptoms of Toxoplasmosis. J. H. Magnusson.—p. 344.
*Pathologic Anatomy of Toxoplasmosis. F. Wahlgren.—p. 349.
*Laboratory Diagnosis and Epidemiology of Toxoplasmosis. S. Gard.—p. 352.
Restraint in Chemotherapy of Tuberculosis. A. Westergren.—p. 357.
Terramycin. N. Diding and R. Lundström.—p. 359.
Xanthomatous Biliary Cirrhosis. J. Myren.—p. 360.
Malignant Insulinoma with Liver Metastases Producing Insulin. M. Iversen.—p. 362.
Pulmonary Chondroma. B. Istre.—p. 363.

Symptoms of Toxoplasmosis.—Recent investigations show infection with Toxoplasma to be much commoner than was formerly supposed. When toxoplasmosis occurs in pregnancy, the infection may be transmitted to the fetus. The earlier in pregnancy the infection occurs, the greater seems to be the danger of fetal death and abortion; if the infection occurs during the later part of pregnancy the infant is born prematurely or at term, but with more or less grave symptoms. The most important symptoms in congenital toxoplasmosis are hydrocephalus, cerebral calcification, chorioretinitis, convulsions, and retarded mental development. Toxoplasma changes can be demonstrated in almost all organs. In typical congenital toxoplasmosis all the cardinal symptoms may be present or one or more may be lacking. Even in typical cases, however, decisive diagnosis must depend on the results of laboratory examinations. There is a form of congenital encephaloretinitis that suggests congenital toxoplasmosis but has a different and unknown etiology. The prognosis varies greatly. Postnatally acquired toxoplasmosis is due to infection in childhood or later and has no effects comparable to the extensive destruction in the central nervous system and eyes found in congenital toxoplasmosis. The author reports eight serologically established cases of postnatal toxoplasmosis, one case in a girl, 9, with peripheral lymphadenitis and signs of encephalitis and seven cases in adults, two infected in a Toxoplasma laboratory and five with spontaneous infections. The onset was acute, with fever, in five cases. The peripheral lymph nodes were involved in six cases. In two cases there was a purely glandular form of clinically manifest toxoplasmosis; this form seems to represent a transition to the subclinical form of the disease. Two patients with symptoms resembling those described by Pinkerton and Henderson were severely ill and had not fully recovered six months after the onset. In one instance with unilateral choroiditis as the only clinically demonstrable symptom the dye test (Sabin-Feldman) titer was 1:2,000 and there was complement fixation in a dilution of 1: 120. Treatment of three cases with aureomycin and one with sulfamerazine ("sulfadimine") had no certain effect.

Pathological Anatomy of Toxoplasmosis.—Necropsy in six serologically verified cases of congenital toxoplasmosis revealed an inflammatory process in the organs of the body, but without exception the most pronounced tissue changes were in the central nervous system. It was concluded that the infection spreads by hematogenous way and that the tissue of the central nervous system is especially susceptible. The grave character and wide extent of the changes in stillborn infants or infants who died at birth point to fetal transmission of the infection. In all cases the mother's blood gave positive serum reactions with high titer values. Biopsy specimens from the lymph nodes in four cases of acquired toxoplasmosis with acute fever and pronounced serologic reactions to Toxoplasma showed rather pronounced inflammation, characterized by swelling of the reticular cells and agglomeration of eosinophilic leukocytes and plasma cells in the tissue. In patients with fever from undetermined cause this pattern might suggest toxoplasmosis.

Laboratory Diagnosis and Epidemiology of Toxoplasmosis.—Congenital toxoplasmosis is commoner than previously supposed. Congenital toxoplasmosis seems always to have clinical manifestations; acquired toxoplasmosis usually seems to be asymptomatic. In congenital toxoplasmosis demonstration of the parasites in the tissue is comparatively easy; they can be demonstrated in great numbers in the cerebrospinal fluid. As blocking of the aqueduct by necrotic masses may prevent escape of the parasites into the lumbar fluid, ventricular puncture is advised. The parasites are identified by inoculation in mice and immunologic analysis of the strain isolated. Serologic tests should be performed in all cases of toxoplasmosis. The method of choice is the dye test according to Sabin and Feldman, in combination with complement fixation. In congenital toxoplasmosis the appearance of complement-fixing antibodies seems to be delayed, while in acquired toxoplasmosis the two reactions run a parallel course. In acute cases the dye test titer usually rises to values of 1: 1,000 or more; decrease is as a rule seen after three to six months. Persistence of high titers indicates the presence of an active focus. For diagnostic purposes repeated examinations are recommended. The toxoplasmin skin test might be useful in epidemiologic surveys. Performance of this test in Stockholm showed a high percentage of positive reactions. The incidence increased from the age of 5 to the age of 20, after which it remained about constant. Preliminary investigations of similar kind in northern Sweden showed a far lower percentage of positive results in adults. The uneven distribution of latent toxoplasmosis indicates an extrahuman reservoir of infection. Evidence points to insect transmission as a mode of spread.

Philippine Medical Association Journal, Manila

27:1-84 (Jan.) 1951

Current Concepts on Carbohydrate Metabolism. N. Cordero.—p. 1.
Bacteriological and Serological Findings in Salmonella Paratyphi Infection. A. P. Roda, Z. Aviado-Tanquintic and M. Jimenez.—p. 7.
Proposed Modification of Segregation of Leprosy Cases in the Philippines. J. G. Tolentino.—p. 21.

Practitioner, London

166:209-310 (March) 1951. **Partial Index**

Modern Concepts of Venous Thrombosis. A. J. Quick.—p. 213.
Treatment of Varicose Veins. R. S. Handley.—p. 228.
Some Reflections on Operative Results Obtained on 600 Varicose Limbs. R. R. Foote.—p. 244.
Some Clinical Aspects of Thrombophlebitis. A. Hunter.—p. 251.
Prevention and Treatment of Thrombophlebitis. C. J. Gavey.—p. 260.
Diagnosis and Treatment of Neuroses in Out-patient Practice. R. Thompson.—p. 269.

Presse Médicale, Paris

59:385-416 (March 28) 1951. **Partial Index**

*Koch's Bacillus in Intermittent Contact With Streptomycin. É. Bernard and B. Kreis.—p. 385.
Osteosarcoma of Mandible: Difficulty of Roentgenologic and Histological Diagnosis. M. Dechaume and F. Baclesse.—p. 387.
Experimental Meningoencephalitis Produced in Rabbits by Intracerebral Injection of Leukemic Products After Filtration: Presence of Intracellular Corpuscles in the Brain. M. Petzetakis.—p. 388.

Koch's Bacillus and Streptomycin.—In vitro experiments were performed with cultures of Mycobacterium tuberculosis obtained on microscopic slides. The technique made it possible to keep the cultures for a certain time in a medium to which dihydro-

streptomycin had been added, then to wash them, to place them in a new test tube with a medium to which dihydrostreptomycin had not been added, and to repeat this procedure at any desired rate. Thus the effect of intermittent contact of M. tuberculosis with dihydrostreptomycin could be studied. Results showed that dihydrostreptomycin continued to inhibit the reproduction of the bacilli after the two were no longer in contact and that the period of inhibition increased with the concentration of the dihydrostreptomycin. At therapeutic concentrations and with bacilli of normal sensitivity, inhibition of bacterial growth was obtained in Youman's medium with a single eight hour contact every second or even every third day. Tubercle bacilli were immersed for several hours in a solution of dihydrostreptomycin of known titer. The bacilli then were removed by centrifugation, and the dihydrostreptomycin solution was again titrated. The significantly reduced titer proved that the antibiotic had been absorbed by the bacilli. This fixation of the antibiotic by the bacilli may explain the persistence of the inhibitory effect of the antibiotic, even if the medium may have become favorable to reproduction. It is essential to remember that the strains of bacilli used were highly sensitive to the drug, that the results varied with the culture medium employed, that the inhibition of the development of the bacilli is only one of the elements of the cure of a tuberculous focus, and that the destruction of the bacilli must be carried out by the organism as a function of the action of the leukocytes, which varies according to local anatomic conditions. The in vitro test must thus be interpreted with caution, but the authors believe that the results obtained may be of therapeutic significance at least in certain human cases.

Revista Española de Pediatría, Zaragoza

7:1-116 (Jan.-Feb.) 1951. **Partial Index**

*Tuberculous Abscesses and Empyema Following Penicillin Therapy. G. Arce and J. Villota.—p. 1.
*Psychic Incontinence of Feces (Encopresis). R. M. Calzada.—p. 15.
*Pseudo-Orchitis in Children. F. J. Fernández.—p. 45.

Tuberculous Abscesses and Empyema Following Penicillin Therapy.—Arce and Villota report 13 cases of tuberculous abscess following intramuscular injections of penicillin and four cases of tuberculous empyema following intrapleural administration of penicillin in therapy of pneumococcic purulent pleurisy. The tuberculin test gave negative results before the development of the tuberculous disease and became positive after it in almost all cases. The clinical course of the disease was typical of primary infection in all patients. Many were infants who had not been exposed to infection, and some had been under constant medical care. The fact that these cases appeared in different clinics and in far distanct locales is evidence that such abscesses were not due to accidental contamination through technical defects at the time of the injection. The authors conclude that the etiological role of penicillin in the production of tuberculous abscesses and tuberculous empyema cannot be doubted in the cases they report. They emphasize the necessity for bacteriologic examination and guinea pig inoculation of the pus of all apparently sterile abscesses that appear in the course of penicillin treatment and of the pus from patients with purulent pleurisy that seem to be aggravated by penicillin therapy.

Psychic Incontinence of Feces (Encopresis).—Six children with psychic incontinence of the feces (encopresis) are reported on. The disease is evident in preschool and school-age children. It is most frequent among neuropaths who come from homes in which the moral, economic, and educative conditions are not favorable. Pathogenically, two mechanisms for the production of encopresis are accepted: (1) an increase in the rapidity and intensity of the defecation reflex, making voluntary control difficult, and (2) a decrease or lack of cerebral inhibition. A third factor is also evident in some cases, namely, hypotonia of the anal sphincter. The author concludes that the prognosis in encopresis is favorable. In the aforementioned cases, the treatment, which consisted of psychotherapy, produced good results in all cases.

Psuedo-Orchitis in Children.—Fernández discusses pseudo-orchitis in children and describes eight cases. The main causal factors of the syndrome are (1) torsion of the spermatic cord, (2) torsion of the sessile hydatid of Morgagni, and (3) the idiopathic hemorrhagic infarct of the testicle. Although the symptoms correspond distinctively to the variety of the anatomic component involved, the differentiation of some forms from others is difficult. The author establishes two phases in the differential diagnosis. In the first phase pseudo-orchitis is differentiated from acute infections, allergic, chronic, tuberculous, and syphilitic orchitis, whereas in the second phase the disease is differentiated from (1) pyogenic nonspecific, tuberculous, acute syphilitic, and chronic epididymitis and (2) epididymis and testicular tumors, local inflammation, and other local diseases. The treatment consists of early surgical detorsion of the testicle and orchiopexy of the testicle to the vaginal tunica of the testicle.

Revista Médica de Chile, Santiago

79:1-64 (Jan.) 1951. **Partial Index**

*Single-Course Treatment of Syphilis. L. Prunes, M. Weinstein and H. Hevia.—p. 1.

Penicillin Implantation in Syphilis.—Results of subcutaneous implantation of procaine penicillin in 63 patients with syphilis are reported. Sixty adult patients each received 2,000,000 units of procaine penicillin (in a simultaneous implantation of two troches of 1,000,000 units apiece). The three remaining patients (children) had a single implantation of 1,000,000 units. In all cases spirochetes disappeared from the lesions within the first 24 hours and the syphilitic lesions healed or disappeared within one or two weeks after penicillin implantation. Ten of the 11 patients with seronegative primary syphilis maintained negative serum reactions during the entire observation period, seven of them for more than seven months. One showed a transitory positive serologic reaction that subsided within one month. All of nine patients with seropositive primary syphilis were controlled during an observation period of more than six months. Fifteen of 17 patients with secondary syphilis maintained negative serum reactions for more than four months. The fourth group of syphilitics who underwent procaine penicillin therapy included two adults with latent syphilis and five children with prenatal syphilis. Control of the disease was effected in all these cases following therapy without recurrences up to the present (more than nine months). The results of this study, on the basis of the 40 patients observed for more than four months, are satisfactory in all the cases of primary syphilis, in 82.7% of the secondary syphilis, and in 80% of the prenatal syphilis cases. Thus, 92.5% of all these patients responded favorably to procaine penicillin implantation therapy.

Schweizerische medicinische Wochenschrift, Basel

81:393-412 (April 28) 1951

Continuous Peridural Anesthesia in Obstetrics: Experience in 105 Cases. A. Iklé and G. Reichen.—p. 393.
*Therapy and Prognosis of Endocarditis Lenta. A. Staehelin.—p. 397.
Clinicoexperimental Study on Terramycin Therapy. A. Bernstein and H. Reber.—p. 402.
Epidemiology of Tuberculosis. H. Birkhäuser.—p. 407.

Subacute Bacterial Endocarditis.—Ten patients between 14 and 54 with subacute bacterial endocarditis were treated with massive doses of penicillin alone or combined with streptomycin for prolonged periods. Injections of water soluble crystalline penicillin were given every three hours. The daily dose varied from 320,000 to 2,000,000 units according to the clinical course. Treatment lasted seven weeks to five and a half months. Two patients received only 320,000 units of penicillin daily but had no recurrence for 20 and 22 months respectively after treatment was discontinued. To shorten the course of the disease, treatment was started with a daily dose of 1,000,000 units in the three patients who have been recently treated. One of the 10 patients, in whom there was complete resistance to penicillin, died from cerebral embolism after seven weeks of treatment. The remaining nine patients recovered. Seven were followed for 10 to 22 months after discontinuation of the anti-

biotics. There were no recurrences. One patient had temporary cardiac decompensation, and another had a cerebral embolism with hemiplegia within four and a half months after treatment was terminated but made a nearly complete recovery. Combined treatment with penicillin and streptomycin (0.6 gm. to 1.2 gm. daily) was given to five patients. Combined treatment with a daily dose of 1,000,000 units of penicillin and 1.2 gm. of streptomycin daily proved superior to treatment with a daily dose of 2,000,000 units of penicillin alone in one patient in whom a penicillin-sensitive but streptomycin-resistant strain of alpha-hemolytic streptococcus was demonstrated. Today combined treatment is the method of choice in resistant cases. It seems to have a bactericidal effect, while aureomycin and chloramphenicol (chloromycetin®) may have only a bacteriostatic effect similar to that of the sulfonamide compounds. Evidence of diffuse or circumscribed myocardial lesions was supplied by electrocardiograms in all 10 patients. Resistant infection and cardiac decompensation are the two main causes for the relatively unfavorable prognosis in subacute bacterial endocarditis. The follow-up period has been relatively short in the author's patients, and exacerbation of the defect of the cardiac valves and of the condition of the myocardium is likely. Early diagnosis seems to be decisive with respect to prognosis, although that has not been definitely proved because of the great variations of the disease.

Semaine des Hôpitaux de Paris

27:1027-1126 (April 2) 1951. **Partial Index**

Recent Progress in Surgical Treatment of Esophagus. D. Adler.—p. 1028.
Primary Carcinoma of Liver in Bantu Races in South Africa. C. Berman. —p. 1034.
Poliomyelitis in South Africa: Study of Its Racial Incidence. J. Gear. —p. 1043.
*Infantile Hemiplegia and Its Treatment by Hemispherectomy. R. A. Krynauw.—p. 1091.

Hemispherectomy in Infantile Hemiplegia.—Hemispherectomy, not including the thalamus and the caudate nucleus and its tail, was performed in 14 patients between the ages of 7½ months and 21 years with infantile hemiplegia. There was one postoperative death, and treatment failed in another patient because of postoperative infection due to the formation of an abscess in the remaining basal portion. Results were highly satisfactory in 12 patients. Ten of these 12 patients had focal or generalized epileptic seizures before the operation, but none of them had attacks postoperatively. The pronounced disturbances of behavior and personality in all the patients were improved to a greater extent than had been expected. This improvement depends on the integrity of the remaining hemisphere and on its capacity for normal function as soon as it has been freed from the abnormal influence of the pathological side. The improvement of tonus and of function with return of motor power and diminished spasticity and clumsiness was significant. Reactions to pinpricks were good in all regions of the body, and articular sensations were restored at least in two patients. The preservation of the caudate nucleus is necessary for the restoration of the motor activity, while the putamen of the lentiform nucleus and the globus pallidus should be removed. The author believes that less radical neurosurgery, consisting of local excisions and incisions may occasionally prevent the recurrence of convulsive attacks, but the mental condition of the patient generally will not be benefited. Epilepsy and/or mental disturbances are to be considered as indications for hemispherectomy in patients with infantile hemiplegia.

27:1127-1160 (April 6) 1951. **Partial Index**

Vaginal Radium Therapy by Stilet Furnishing an Axial Source of Irradiation in Cancer of Cervix Uteri. J. Swyngedauw and J. Nuytten. —p. 1127.
Physiopathogenesis of Hyperthyroidism. E. Azérad.—p. 1132.
*Cerebral Pneumatotherapy with Pure Oxygen: Technique, Indications, Biologic Syndrome, Results. P. Abély, P. Borenstein and J. Puech. —p. 1145.

Cerebral Pneumatotherapy with Pure Oxygen.—Cerebral pneumatotherapy with pure oxygen instead of air was practiced in a large number of psychiatric cases in the course of three years. By lumbar puncture 40 to 60 cc. of oxygen was injected into the subarachnoid space in two stages. The amount of oxygen injected equalled the amount of the cerebrospinal fluid removed. The pressure of the cerebrospinal fluid after the second injection was always significantly higher than at the beginning of the intervention. A terminal overpressure is indispensable for satisfactory results. The indications for pneumatotherapy with pure oxygen are the same as for that with air, but the biologic changes obtained within two hours of the intervention differed with the two techniques. Constant hypoglycemia, particularly pronounced in the first hour, was observed after the injection of oxygen in contrast to hyperglycemia after the injection of air. While red blood cell counts showed no changes after the injection of air, there was a definite increase in red blood corpuscles three to five hours after the injection of oxygen, and there was in addition neutrophil hyperleukocytosis at the fifth hour after the injection. The serum calcium level was significantly increased in only two patients, who were spasmophilic. Mild but constant hypoglycorrhachia was observed after the injection of oxygen. Examination of vaginal smears revealed shortening of the menstrual cycle and a rapid increase in acidophil estrogenic cells. Pneumatotherapy proved to be most effective when practiced in the preovulation period. Cerebral pneumatotherapy is to be considered a more satisfactory and less painful method with pure oxygen than that with air. It is suggested that the oxygen exerts an effect on the diencephalon by restoring simultaneously the whole equilibrium in some psychiatric cases. The oxygen injections may be repeated at three week intervals for more lasting results. Pneumatotherapy with oxygen is particularly advised in postpartum psychoses, since constant and permanent results were obtained in about 100 such cases.

Settimana Medica, Florence

38:555-574 (Nov. 30) 1950. **Partial Index**

*Observations on Use of Corticosterone and Ascorbic Acid in the Cure of Arthropathies. G. Tassinari and L. Rindi.—p. 561.
*Therapy of Brucellosis. M. Bassi and S. Menci.—p. 566.

Corticosterone and Ascorbic Acid in Arthropathies.—Tassinari and Rindi administered desoxycorticosterone acetate and ascorbic acid in treatment of arthropathies of different origin and nature in 15 patients of either sex between the ages of 25 and 74. The disease was severe and of several years' duration in all cases. One intramuscular injection of 5 mg. of desoxycorticosterone acetate in oil was given daily, followed immediately by an intravenous injection of a solution containing 1 gm. of ascorbic acid. The injections were given for a period that varied between 10 and 20 consecutive days, except to two patients who wished to discontinue treatment after three and five injections respectively, because of intolerance to it. The effects on pain and muscular function were spectacular but transient in four cases, mediocre and transient in four patients, and nil in seven patients. These drugs resembled cortisone in the clinical effects of the treatment and the lowering of the erythrocyte sedimentation rate several days after administration. The necessary doses, as given to the aforementioned patients, produced toxic symptoms, mainly hypertension with acute headaches, dizziness, in some cases acute or mild pruritus all over the body, and cardiac or renal symptoms in patients with cardiac or renal disease. The toxic symptoms subsided after discontinuation of the treatment. The authors therefore conclude that a definite cure was obtained in no case, but that the aforementioned treatment is of value in arthropathies of recent onset. The treatment is contraindicated for patients with hypertension, arteriosclerosis, or cardiac or renal diseases.

Therapy of Brucellosis.—Bassi and Menci administered one or more modern types of treatment to several groups of patients with acute brucellosis. The authors conclude that chloramphenicol and its synthetic derivatives are of the same therapeutic value as aureomycin in brucellosis. Antibrucellar vaccines, after chloramphenicol therapy, diminish the necessary quantity of the antibiotic and cause a permanent immune reaction. The administration of neoarsphenamine followed by administration

of antibrucellar vaccines is indicated in very acute cases and when chloramphenicol cannot be obtained. The combined treatments of sulfadiazine, streptomycin, and quinacrine dihydrochloride (atabrine®) or of sulfadiazine, streptomycin, and penicillin provide a rapid and definite cure in cases particularly resistant to usual therapy.

Thorax, London

6:1-102 (March) 1951

Carcinoma of Bronchus: Report on First Five Years' Work of Joint Consultation Clinic for Neoplastic Diseases of the Brompton Hospital and the Royal Cancer Hospital. W. D. W. Brooks, M. Davidson, C. P. Thomas and others.—p. 1.
*Prophylactic Streptomycin in Thoracoplasty Operations: Report to the Medical Research Council.—p. 17.
Lung Resection for Pulmonary Tuberculosis. B. J. Bickford, F. R. Edwards, J. R. Esplen and others.—p. 25.
*Radiological Study of Relationship Between Tuberculosis and Pneumokoniosis in Coal Miners. K. J. Mann.—p. 43.
Hiatal Hernia and Short Oesophagus in Children. E. Husfeldt, G. Thomsen and E. Wamberg.—p. 56.
End-to-End Bronchial Anastomosis After Accidental Division of Stem Bronchus. J. Mathey and G. Oustrieres.—p. 71.
Endometriosis of Pleura. H. Nicholson.—p. 75.
Two Cases of Bronchiogenic Cyst Associated with Anomalous Arteries Arising from Thoracic Aorta. E. Tosatti and J. A. Gravel.—p. 82.

Prophylactic Streptomycin in Thoracoplasty Operations.—A controlled study of the effect of routine streptomycin administration at the time of thoracoplasty is described. Two comparable groups of patients were observed. One group of 325 patients (the S group) received 1 gm. of streptomycin daily for two days before and 21 days after each operation or stage. The local application of 1 gm. to the wound at the time of operation was optional. Another group of 287 patients (the control or C group) received no streptomycin locally or intramuscularly before or after operation unless they were considered to have a tuberculous lung "spread" or a tuberculous wound infection. In the event of any complications, patients from either group were given 1 gm. of streptomycin daily for eight weeks or for four months, if necessary. The incidence of contralateral spread did not differ significantly between the two groups, but there was a significantly greater number of homolateral spreads in the controls than in the S cases. There was no significant difference between the groups in the incidence of transient or persistent atelectasis after operation. The incidence of serious wound infections was significantly greater in the controls. Sputum examination three months after operation did not show any statistically significant difference between the S and C groups. The total deaths, up to six months after operation, included six in the S group and eight in the C group. In the control group 11.6% of the men but only 4.0% of the women had homolateral spread postoperatively, whereas 8.7% of the men and only 2.4% of the women had operation wounds unhealed after three months. The routine use of streptomycin prophylactically in thoracoplasty operations is not advocated. The drug is best reserved for treatment of complications.

Tuberculosis and Pneumonoconiosis in Coal Miners.—A study of the development and progression of tuberculous shadows in the roentgenograms of coal miners is reported. In all, there were 1,514 pairs of roentgenograms. In 139 pairs the first showed a tuberculous shadow of clinical significance, and these 139 were used for the study of the progression rate. The remaining 1,375 pairs were used for study of the attack rate of tuberculosis, which, in the reinfection type of tuberculosis, was found to be related to the severity of the associated simple pneumonoconiosis. It is apparently reduced in cases of complicated pneumonoconiosis. The progression rate of tuberculosis in the presence of simple pneumonoconiosis is apparently slow. The prevalence of tuberculosis appeared to be higher among miners with simple pneumonoconiosis than in the general population. This high prevalence is related to the higher attack rate and lower progression and mortality rates from tuberculosis in miners compared with the normal population. Progressive massive fibrosis, characteristic of complicated pneumonoconiosis, may in itself be a modified form of tuberculosis occurring in a lung already affected by simple pneumonoconiosis.

Tubercle, London

32:49-72 (March) 1951

Domiciliary Use of Paramisan Sodium in Treatment of Pulmonary Tuberculosis. D. L. Pugh and E. R. Jones.—p. 50.
Diffuse Encephalopathy After Streptomycin Treatment. J. R. Edge.—p. 58.

32:73-96 (April) 1951

Anti-Tuberculosis Work in County of Uppsala, Sweden: Part II. BCG Vaccination, Morbidity and Mortality in Tuberculosis. E. Hedvall.—p. 74.
Investigation into Effects of Tuberculous Infection on Physical Growth of Children. B. Benjamin and F. A. Nash.—p. 82.
Treatment of Tuberculous Empyema by Aspiration. A. H. M. Siddons and M. L. Konstam.—p. 85.

Ugeskrift for Laeger, Copenhagen

113:277-306 (March 8) 1951

Renal Acidogenesis. K. Lundbaek.—p. 277.
*Combination Resection-Injection Treatment of Varicose Veins: Follow-Up Examination. A. Birch-Jensen.—p. 281.
Maintenance of Open Air Passage in Unconscious Patients. E. Nilsson and J. Marquardsen.—p. 286.
Experiences with Narco-Electro-Curare Shock: Preliminary Report. J. Kaldan.—p. 287.
"Septacrol" (Ciba). F. Tvedegaard.—p. 288.

Combination Resection-Injection Treatment of Varicose Veins.—Birch-Jensen says that varices are chiefly treated in four ways: conservatively, surgically, by injection, and by combined surgery and injection. Combined resection and injection has been used at Aarhus Municipal Hospital since 1947. Follow-up examination was made in 129 cases, in 75 men and 54 women, operated on from 1947 to 1949. In most cases the disorder had been present from 15 to 20 yr. There was at least nine months' observation time. Completely satisfactory objective results were seen in 66% of the cases and more or less pronounced recurrence in 34%. Subjective results were better than objective ones.

113:353-374 (March 22) 1951

*Acquired Toxoplasmosis: Seven Cases of Strongly Positive Toxoplasma Reactions. J. J. C. Siim.—p. 353.
Demonstration of Tubercle Bacilli in Stomach Resection. K. Iversen and W. Kiaer.—p. 358.

Acquired Toxoplasmosis.—Seven cases of acquired toxoplasmosis, all with strongly positive Toxoplasma reaction, are reported. The main symptom was a pronounced pathological swelling of the lymph glands. In three patients universal adenitis was the only symptom, in three there were fever and uncharacteristic catarrhal symptoms, and in one pronounced fatigue. There was no exanthem, and the Wassermann and Paul-Bunnell reactions were negative. The glandular swelling lasted several months, and in three cases convalescence was characterized by much fatigue. No changes in the central nervous system and eyes such as dominate the picture in congenital toxoplasmosis were observed. Acquired toxoplasmosis may run its course as an inapparent infection. The author considers it likely that in the future positive Toxoplasma reactions will be found in at least some of the cases clinically diagnosed as mononucleosis. The natural mode of infection is not known, but the possibility of transmission through the alimentary canal as well as by insects must be considered.

Wiener klinische Wochenschrift, Vienna

63:125-140 (Feb. 16) 1951

Diagnosis of Congenital Cardiac Defects Suitable for Surgical Intervention. E. Mannheimer.—p. 129.
*Cerebral Lobectomy. K. Huber.—p. 134.
Immediate Satisfactory Results of Extirpation of Larynx for Carcinoma. O. Novotny.—p. 135.

Cerebral Lobectomy.—Lobectomy was performed on 13 patients, three men and 10 women between the ages of 20 and 50, of whom five had an oligodendroglioma and eight an astrocytoma. The frontal lobe was excised in 10 instances and the occipital lobe in three. Three patients died soon after the operation, but residual tumors were not demonstrated on necropsy. These patients died from acute anemia; preserved blood was

not yet available for transfusion at the time of the operation. Four other patients died in one to seven years after the intervention. Necropsy was performed in two of them, and it revealed recurrences of the tumors. Two other patients were followed for three years and were free of complaints. The last four of the 13 patients answered a questionnaire. One operated on 12 yr. ago still had epileptic attacks and was blind, but already was so at the time of operation; two operated on one and six years ago had occasional attacks, but their working capacity was partially restored. The last remaining patient, operated on eight years ago, recovered completely and is able to do agricultural work. Homonymous hemianopsia occurred after the excision of the occipital lobe in two patients, but the patients were not much disturbed by it. An insignficant decrease in function occurred after frontal lobectomy in two other patients. The indications for lobectomy were justified in these 13 patients except for the two with recurrences. In spite of careful microscopic examination of the tumor in the course of the intervention, recurrences cannot always be avoided, because the extension of the tumor may not be visible macroscopically and it may not be possible to establish the presence of multiple tumors. The author believes that only frontal or occipital lobectomy is indicated and that either should be performed only for astrocytoma and oligodendroglioma. Diagnosis based on ventriculography should not alone be decisive for performance of lobectomy; the general condition of the patient must also be considered, and the definite decision should be made only after exposure of the brain. Lobectomy should not be performed as palliative treatment, since the result that may be expected will not justify the magnitude of the intervention.

63:249-264 (April 6) 1951. **Partial Index**

Serum (Plasma) Proteins in Health and Disease. R. Bauer.—p. 254.
Eclampsia Induced by Neurovegetative Disturbance of Circulation. H. Knaus.—p. 257.
*Treatment of Gonorrheal Vulvovaginitis with Penicillin. H. Peer.—p. 261.

Penicillin in Gonorrheal Vulvovaginitis.—Twelve female infants with gonorrheal vulvovaginitis were treated with penicillin. Fifty thousand units of the antibiotic were injected every three hours, with a total dose of 500,000 units. Local treatment was not given. The author advises against hormone therapy as an unphysiological procedure in the infant. Untoward reactions to penicillin were not observed. All the infants made a complete recovery. They remained in the hospital for an average period of one month. Cultures and microscopic follow-up studies were done for six months. Despite the unfavorable reports by other workers, penicillin therapy is considered the method of choice for gonorrheal vulvovaginitis in infants, provided that the adequate total dose of 500,000 units is administered. Combined treatment with estrogens or sulfonamide compounds is not necessary.

Zeitschrift für klinische Medizin, Heidelberg

148:1-118 (March 12) 1951. **Partial Index**

Pathogenesis of Atypical, Shortened AV-Conduction (Wolff-Parkinson-White Syndrome). E. Gadermann.—p. 1.
Faulty Regulation of Water Metabolism in Patients with Diseases of Diencephalohypophysial System. H. Leveringhaus.—p. 12.
*Clinical Picture and Therapy of Endocarditis Lenta with Particular Consideration of Treatment with Streptomycin and Massive Doses of Penicillin. H. Kleinfelder.—p. 53.

Treatment of Endocarditis Lenta.—Forty patients, 37 men and three women, between the ages of 20 and 40, with endocarditis lenta are reported on. Nineteen patients had a defect of the cardiac valves that preceded the endocarditis lenta. The clinical picture of the disease was highly characteristic, with the organic heart defect detected by auscultation, enlargement of the spleen, focal nephritis, extremely increased blood sedimentation rate, temperatures ranging from subfebrile to fever, and clubbed fingers. Since January, 1948, 32 of the 40 patients had been treated with antibiotics. Seven patients were treated with 500,000 units of penicillin daily for 28 days, according to Christie's schedule, but a cure was not obtained in any of these patients, although the daily dose was increased to 800,000 units, with a total dose of 30 million units. Recovery resulted in seven of 11 patients who received massive doses of penicillin up to 6,000,000 units per day for eight weeks. Only temporary improvement had been obtained previously with smaller doses of penicillin in these patients. Twenty patients were given daily doses of 1 to 2 gm. of streptomycin, up to a total dose of 90 gm. Four patients recovered, and another was expected to. Four of these patients had responded only partially or not at all to previous treatment with penicillin. Streptomycin should be given a therapeutic trial in every case in which the symptoms of infection may not be satisfactorily improved by appropriate doses of penicillin. Since January, 1949, 12 of 21 patients who were treated with massive doses of penicillin and to whom streptomycin was given as an adjunct have definitely recovered. Recovery was expected in another patient. It should be emphasized that these highly satisfactory results were obtained in 62% of patients who had been ill for more than six months before treatment was instituted. Experience showed that prognosis of endocarditis lenta is unfavorable in patients with aortic insufficiency and pronounced hemodynamic manifestations; the occurrence of cardiovascular decompensation must be expected in the majority of these cases. The prognosis is more favorable in patients with a pure mitral effect, stenosis of the aorta, or aortic insufficiency not associated with hemodynamic manifestations.

Zentralblatt für Chirurgie, Leipzig

76:161-224 (No. 3) 1951. **Partial Index**

*Prophylaxis and Therapy of Thromboembolism and of Postthrombotic Disturbances. H. A. Thies.—p. 164.
Study of Metabolism in Patients After Gastrectomy. K. Kremer.—p. 178.
Pyocyaneus-Meningitis After Lumbar Puncture. H. Reitter.—p. 181.

Prophylaxis and Therapy of Thromboembolism.—Of 1,229 patients who underwent major surgical intervention at the university surgical clinic in Hamburg in 1950, 40 (3.3%) had a postoperative thrombosis and six (0.5%) had a pulmonary embolism. One of these six patients died before medicinal treatment could be instituted. Postoperative prophylaxis of thrombosis with bishydroxycoumarin (dicumarol®) was given only to adipose and cachectic patients, to those with varicose veins, and to those with a history of previous thrombosis. Bishydroxycoumarin treatment was instituted on the third to fourth postoperative day with a dose of 200 mg. daily for the first two days. Subsequent doses depended on the prothrombin time, which was determined daily and maintained as nearly as possible between 20 and 40% of normal. In addition, 400 mg. of pure rutin was given daily for the protection of the vascular wall. Hemorrhages did not occur during this prophylaxis. So that the process of wound-healing would not be interfered with, heparin was not administered during the first 24 to 48 hr. necessary for bishydroxycoumarin to become effective. Not a single instance of thrombosis or embolism was observed during this prophylactic treatment, but the number of patients so treated was too small for definite evaluation of bishydroxycoumarin prophylaxis. Treatment of thrombosis or thrombophlebitis with bishydroxycoumarin was combined for the first three days with moist dressings and raising of the extremity, since heparin was not available. Hypoprothrombinemia of at least 20% and even less was the goal as long as symptoms of thrombosis were still manifest. Moist dressings were discontinued as soon as a prothrombin time of 30% was obtained; when it oscillated around 15% (usually after five days) the patient was allowed to move the extremity at will. Pain and tension usually disappeared within four to six days, and the duration of the thrombosis was shortened to eight to 15 days. Mild, short embolic attacks occurred in only 10 patients but did not necessitate special measures. Daily determination of prothrombin time, immediate institution of bishydroxycoumarin, and sufficient hypoprothrombinemia are indispensable for cure. The author's results as well as those reported in world literature showed that the anticoagulants are superior to any other drug used for prophylaxis or treatment. Although the anticoagulants were not always effective, the incidence of thrombosis, its duration, and the incidence of fatal embolism were much reduced. Severe hemorrhage may occur in about 2% of the cases, but death may be prevented nearly always with transfusions of fresh or preserved blood with sufficiently high prothrombin content. Heparin and bishydroxycoumarin do not clear up postthrombotic disturbances.

BOOK REVIEWS

Fundamentals of Clinical Fluoroscopy with Essentials of Roentgen Interpretation. By Charles B. Storch, M.D., Adjunct, Radiodiagnostic Department and Radiotherapy Department, Beth-El Hospital, Brooklyn, New York. Cloth. $6.75. Pp. 196, with 217 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

To an old radiologist trained in the Holzknecht (Vienna) and the Levy-Dorn (Berlin) early schools of roentgenology, there is a nostalgic and comforting thrill to this author's attempt to arouse or revive an interest in fluoroscopy. The technological triumphs of modern radiography would seem to eclipse the fundamental and clinical satisfactions inherent in fluoroscopy. Of course it is essential that plenty of clinical experience enter into the interpretation of the fluoroscopic images, and it is also important to observe the demands for protection of both patient and fluoroscopist. As the author states, the literature of fluoroscopy is scarce and scattered. It is a neglected waif of radiology. The author also admits a Socratic adherence to logic and answerableness that is commendable. The author does not presume that fluoroscopy is a competitor to roentgen films. Rather fluoroscopy amplifies and frequently serves to avoid an unusual number of films for the patient in whom the movement or pressure displacement of viscera needs to be surveyed. The thoracic cage becomes an alluring and resourceful field for fluoroscopy, with its shift of fluid level, the diaphragmatic excursion, and the mediastinal variations by position. Abdominal emergencies of various types of gas retention from several causes can be studied without the inevitable delays of radiography. Now that amplification of fluoroscopic images with substantial gains in visual acuity and increased brightness of the screen images is available, there is every reason for one to believe that this revival of fluoroscopic interest is more than justifiable. Fluoroscopy must and will emerge from this tunnel of darkness in which it has been for decades. But there must be full understanding and observance of the demands of protection and the necessity of familiarity with normal and abnormal fluoroscopic anatomy and physiology, in addition to a full measure of clinical comprehension. Radiologists of this generation have had little experience with fluoroscopy compared to the first generation of continental radiologists who were trained with glass plates without even screens to intensify images. It is going to be interesting to witness this revival of simple fluoroscopy. This good book can show the way.

Therapie der Nerven- und Geisteskrankheiten. Herausgegeben von Wolfgang Holzer, Professor Dr.med. et Dr.Ing., Vorstand der psychiatrisch-neurologischen Universitätsklinik in Graz. Unter Mitarbeit von Hans Eichhorn, et al. Redigiert von Ernst Pichler. Cloth. Pp. 407, with 28 illustrations. Wilhelm Maudrich, Spitalgasse 1B, Wien IX/2, 1951.

The editor, Dr. Holzer, restricts himself to a general medico-philosophical introduction and relegates the main task to his associates. This treatise covers all types of therapeutic procedures, such as pharmacotherapy, physical therapy, therapeutic operations on the central and peripheral nervous system, specific therapy in diseases of the brain and meninges, treatment of neurosyphilis, and other diseases of the spinal cord, peripheral nerves and neuromuscular system. There are chapters on diagnostic procedures, shock treatments, convulsive disorders, psychotherapy, therapeutic use of hormones, vitamins, diets, and therapy of acute injuries to the central nervous system.

This monograph contains little that is of value to the practicing neurologist or psychiatrist. It is filled with therapeutic suggestions that have been gleaned from the literature of the past century and put together without critical evaluation. Most of the recommended forms of therapy are obsolete; to mention a few striking examples, leeches in cerebral hemorrhage, mercury and bismuth in central nervous system syphilis, morphine in postconcussion delirium, convalescent serum in epidemic encephalitis, and malarial fever treatment of acute anterior poliomyelitis. On the other hand, established methods of treatments which have been in use for a number of years are omitted or barely considered; for example, penicillin in neurosyphilis, the surgical procedures in cerebral aneurysms, and the value of the newer antibiotics. Many disease entities are not considered. The importance of the electroencephalogram in diagnosis and control of treatment of epilepsy is overlooked, and topectomy, transorbital lobotomy, and electronarcosis in the treatment of mental disorders are not mentioned.

These are but few examples of the defects of this monograph. It gives the impression of a book written in haste, by authors who have had little practical experience and who do not have the critical judgment which is needed in writing on subjects of therapy. Some of the defects may be excused on the basis that progress in medical science has been retarded in Austria by the war. This does not, however, excuse the lack of order in the presentation of the material and the failure of the authors to use discrimination in the selection of methods of therapy.

The printing of the book is good, but the binding is weak and easily broken. There are 28 illustrations, most of which pertain to the technic of lumbar and cisternal puncture and do not add to the value of the book. There is an inadequate bibliography at the end of each chapter. Practically all the references are to the German literature. References to the foreign literature cited in the text are not included in the bibliography. There is an adequate index.

Therapies in all fields of medicine are changing rapidly. The authors have not kept apace with the advances in the field of neurology and psychiatry. Their monograph is not, therefore, of any value to the student or to the specialist.

Roentgenologic Diagnosis of Diseases of Bones. By David G. Pugh, Assistant Professor of Radiology, Mayo Foundation, Graduate School, University of Minnesota, Minneapolis. [Reprinted from Nelson's loose-leaf Diagnostic Roentgenology.] Cloth. $6. Pp. 316, with 307 illustrations. Thos. Nelson & Sons, 19 E. 47th St., New York 17; Parkside Works, Dalkeith Road, Edinburgh 9, 1950; 1951.

This book is the section with the same title in Nelson's loose-leaf "Diagnostic Roentgenology," edited by Dr. Ross Golden, Chief of the Department of Radiology at the Columbia Medical Center at New York City. This original section was written by Paul Hodges, Phemister, and Brunschwig. Pugh has retained much of the original section, which he acknowledges, and has added much, especially on the endocrinal, vitaminic, rheumatoid, neurologic, hematologic, and orthopedic categories of bone disease. Fractures are not discussed as such, but fractures as complications of systemic bone disease receive good attention. The dystrophies of bones receive elaborate attention, as do also bone tumors. There used to be about four bone diseases, to wit: tuberculosis, osteomyelitis, syphilis, and cancer. When improved sanitation methods for cattle and milk were adopted, the virtual elimination of tuberculosis followed. The sulfonamides have about eliminated osteomyelitis. Penicillin has conquered syphilis, and now the problem of malignancy is about to be solved. But a new array of bone diseases have arisen to baffle diagnostic skills. Pugh's book provides the avenues of analytical roentgen diagnosis. No longer does the orthopedist alone treat bone disease and trauma. Now the endocrinologist, the rheumatic and cardiac specialist, the neurologist, and others are appropriating treatment of bone diseases, each into his own specialty. But a book like this will help any and every specialist. Perhaps general practitioners might and could appropriate this whole field of the newer diseases of bone, saving the radiologist as the court of last resort.

Pugh's book is worthy of the author and his background. If Pugh has missed any of the new expressions of bone disease, it is just because they have not as yet been discovered. When bigger and better bone diseases are provided, Pugh can add appropriate postscripts.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

QUERIES AND MINOR NOTES

TRANSMISSION OF RABIES

TO THE EDITOR:—*1. Can a flea biting a rabid animal transmit rabies? 2. Can chickens contract the disease from a rabid animal? If so, can the fowl transmit the disease to an animal or human? 3. If a pregnant rabid dog is delivered by cesarian section and the mother animal has no contact with the litter, can the puppies develop rabies? If the veterinarian punctured his hand with the knife or needle during the operation, would he contract rabies? 4. I have been informed by a veterinarian that the virus has been recovered in the urine or milk of a rabid animal or cow. Is that correct? 5. If a dog is immunized against rabies can that animal become a carrier of the virus and infect a person by biting or can he transfer the virus to an unprotected animal?*

Bernard Greenberg, M.D., Brooklyn.

ANSWER.—1. No, rabies is not transmissible by fleas or any other arthropods. 2. (*a*) Yes, domestic fowl may contract rabies, although they are not so susceptible as mammals. (*b*) No instance is known in which rabies was transmitted by rabid chickens. 3. (*a*) This is a rather hypothetical situation, with which there is little or no practical experience. Natural transplacental transmission following natural infection in dogs has not been recorded. However, Konradi (*Zentralbl. Bakt.* **42** [pt. 1]:203, 1908) observed that rabies could be transmitted by pregnant dogs, following experimental infection, to the fetus and offspring. Other workers have failed to confirm this transplacental passage of the virus. (*b*) This is extremely unlikely in the light of present knowledge. Accidental contamination of the surgeon's or pathologist's wound would be more likely from contact with pancreas, kidney, or mammary glands, since the virus may sometimes be present in these tissues. 4. (*a*) Yes, rabies virus has been recovered from the urine or milk of rabid animals. (*b*) Infection from the handling of infected milk or urine is a very improbable mode of transmission. The danger of such occurrence would depend on the entry of the infected fluid into a substantially severe and fresh wound and also on the concentration of the virus in the contaminating fluid. Ingestion of infected cow's milk is a highly unlikely mode of transmission. 5. No, if a dog is immunized and fully protected, remaining refractory to infection, he will not be capable of transmitting the virus. In dogs there is no evidence of symptomless carriers of rabies whether immunized or not.

TOXICITY OF TITANIUM

TO THE EDITOR:—*I would like information on titanium poisoning.* *J. B. Havron, M.D., South Pittsburg, Tenn.*

ANSWER.—Titanium long has been accepted as without known toxicity. Its commonest form, titanium dioxide, is utilized in high tonnage in paint manufacture under conditions of gross exposure without known injury to workmen. Smaller quantities are introduced into cosmetics and skin medicaments without complaint of undesirable qualities. The term "titanosis" appears in the literature, and here and there cases have been reported in which pulmonary lesions have been attributed to titanium. Usually the onus may be traced to admixed materials such as silica. What has been noted in the case of titanium dioxide is not always true for some other compounds. Various salts may be detrimental, not because of the presence of titanium, but on account of associated radicals. Thus, titanium tetrachloride and titanium potassium fluoride may serve as examples of toxic agents in the action of which titanium itself is unfairly held responsible.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

TREATMENT OF GASTRIC CRISES

TO THE EDITOR:—*A 51 year old man has had six severe attacks of gastric crises of tabes within the past year. A diagnosis of tabes was made in 1942, and he was given two years' treatment with arsenicals and bismuth. In 1945, he began to have gastric crises and was given 12,000,000 units of penicillin. Fever therapy was given but could not be tolerated. Beginning in August 1950, I gave him 250 mg. of aureomycin four times daily for three weeks. He has had two attacks of gastric crises since then. Five blood tests between 1946 and 1948 showed positive Kolmer (430000 to 444000) and Kahn (012 to 013) reactions. In May 1947 colloidal gold was 1221110000-0 and 12 mononuclear cells were found in the spinal fluid. At present the blood Kahn, Kolmer and Kline reactions are negative. Your opinion as to further treatment would be appreciated.*

Edward C. Halley, M.D., Fresno, Calif.

This inquiry was referred to two authorities, whose respective replies follow.—ED.

ANSWER.—Some of these patients seem to progress despite all treatment, but others can be helped by a combination of specific and nonspecific measures. This patient has apparently had adequate amounts of specific therapy, but because of the elevated cell count in 1947 the spinal fluid should be reexamined for evidence of relapse or resistance. If there is any abnormality in cell count, protein, colloidal gold curve or spinal fluid Wassermann reaction, it might be of value to give another course of penicillin (9,000,000 units over a period of three weeks) followed by a reexamination of the spinal fluid in six months. Some syphilologists also give courses of 10 weekly injections of bismuth (bismuth subsalicylate in oil, 1.5 cc. intramuscularly) alternating with two month rest periods as long as the spinal fluid remains positive.

Nonspecific therapy may be of even greater importance. Marked symptomatic improvement often results from the following measures used in combination for many months: large doses of vitamin B complex, daily ultraviolet rays to the entire body, weekly autohemic injections for 10 weeks, elimination of coincidental infection, avoidance of exertion and insistence on adequate sleep with barbiturate sedation if necessary. Morphine should not be used for the recurrent gastric crises. Many patients thus treated die of the effects of addiction rather than from their disease. In the place of morphine, 3.0 Gm. each of chloral hydrate and sodium bromide in 30 cc. of water should be given per rectum and retained. This can be repeated every four hours as needed. Combinations of acetylsalicylic acid, phenacetin and sodium bromide may also be given by mouth for pain. Epinephrine, 0.5 cc. intramuscularly, sometimes stops an attack. Intravenous administration of dextrose and sodium chloride solution is essential if vomiting is severe.

ANSWER.—Gastric crises in tabes dorsalis are rarely benefited either by metal chemotherapy, penicillin, or any other form of drug therapy. There is perhaps a 25 per cent chance of complete relief and a 50 per cent chance of marked amelioration (in decrease of frequency and severity of attacks) if the patient can be properly treated with fever by means of induced tertian malaria. Whether this can be accomplished depends in part on his physical status and in part on the expertness of medical and nursing care during the malaria. If malarial therapy is without avail (and it should certainly be tried, if possible, before anything else), there remain only two possible recourses. The first of these is control of the attacks by means of morphine or a derivative, which obviously incurs the grave risk of addiction. The second is one of the several neurosurgical procedures that have been utilized with more or less success in the treatment of this condition. The most satisfactory of these operations is probably cordotomy, or combined sympathectomy and vagotomy.

DENTIFRICE CONTAINING FLUORIDE

To the Editor:—*Is there any evidence on the desirability of using aqueous sodium fluoride solution brushed on the teeth daily? What strength would be considered most suitable?*

A. McQ. Thomson, M.D.,
Middle Park, Victoria, Australia.

Answer.—The results of a clinical study (Bibby, in "Dental Caries-Mechanism and Present Control Technics," St. Louis, C. V. Mosby Company, 1948, p. 151) in which children used a liquid dentifrice containing sodium fluoride do not support this suggestion. No reduction in dental caries was observed at the end of one and two years.

Indiscriminate distribution of even a 0.5% solution of sodium fluoride may not be free of hazards. The possibility that death of an adult human might result from the absorption of as little as 105 mg. of fluorine has been indicated (Gettler and Ellerbrook: Toxicology of Fluorides, *A. J. M. Sc.*, **197**:625 [May] 1939). This is the amount of fluorine in 50 cc. of a 0.5% sodium fluoride solution. An LD_{50} of 50 mg. or more per kilogram of body weight may be a better estimate of the acute toxicity of sodium fluoride (McNally: Four Deaths Caused by Sodium Fluoride, *J. A. M. A.* **81**:811 [Sept. 8] 1923; Cox and Hodge: Toxicity of Fluorides in Relation to Their Use in Dentistry, *J. Am. Dent. A.* **40**:440 [April] 1950). Even this value shows the dangerous potentialities of 0.5% solutions if made accessible to children.

CANCER AND THE PITUITARY GLAND

To the Editor:—*Has research been done on a possible correlation of cancer and the anterior pituitary?*

M.D., New York.

Answer.—There are no definite data in the clinical literature that demonstrate a direct correlation between the function of the anterior pituitary and the development of cancer. Certain animal experiments suggest that anterior pituitary hormones may be involved in the development and growth of tumors. Administration of a purified pituitary growth hormone to rats by Moon and his colleagues resulted in the development of neoplasms in several different organs. Administration of other purified pituitary hormones to animals has not been reported to produce neoplasms. Hypophysectomy may alter the rate of growth of certain transplantable tumors in animals.

There is evidence in both man and animals that alteration of the endocrine balance, especially of the adrenal cortex and gonads, can influence the rate of growth of some neoplasms. Alteration of gonadal function in certain strains of animals has been demonstrated to result in the development of neoplasms. Since the endocrine function of the adrenal cortex and gonads is regulated by tropic hormones from the anterior pituitary, it is reasonable to suppose that alterations in the function of the anterior pituitary might influence the development and growth of tumors. Quantitative methods for the determination of anterior pituitary function in man are not adequate to permit critical evaluation. Recent advances in the preparation of purified anterior pituitary hormones will afford an opportunity to determine the effects of these substances when administered to animals and man.

INOPERABLE LUNG CANCER

To the Editor:—*A patient with carcinoma originating in the apex of the left lung has been declared inoperable. Can you give me information as to whether aminopterin or amethopterin would be of benefit in this case?* *M.D., Louisiana.*

Answer.—Aminopterin and amethopterin are folic acid antagonists which are still decidedly in the experimental stage. Also, they are by no means free from toxic effects. There is no good evidence that they will be useful in the treatment of advanced cancer. The article by Schoenbach, Greenspan and Colsky entitled "Reversal of Aminopterin and Amethopterin Toxicity by Citrovorum Factor," which appeared in The Journal Dec. 30, 1950 (page 1558) elaborates on this subject.

HYDROGEN ION CONCENTRATION OF CEREBROSPINAL FLUID

To the Editor:—*1. What is the permanganate or organic index of cerebrospinal fluid? 2. What variation occurs in the hydrogen ion concentration of the cerebrospinal fluid in tuberculous meningitis?*

S. M. Epple, M.D., Cleveland.

Answer.—The permanganate or organic index is a figure expressive of the total amount of organic matter in the cerebrospinal fluid as measured by the reduction of a solution of potassium permanganate of known strength. The normal index for fluid withdrawn by lumbar puncture is 1.3 to 1.8, ventricular and cisternal fluids having indexes which are slightly lower, 1.1 to 1.5. A most marked increase occurs in organic disease of the meninges. High values are found in all disorders associated with increase in the cell and protein content of the fluid. Contamination of the fluid with blood invalidates the results of this test. In general the index parallels the cell and protein content of the fluid. The determination of the permanganate index adds little to the information gained from other, more specific, procedures. The hydrogen ion concentration of cerebrospinal fluid examined immediately after withdrawal is almost the same as that of the blood, the p_H varying normally from 7.4 to 7.6. Levinson has found that when the cerebrospinal fluid is allowed to stand, exposed to air, the alkalinity increases, because of the loss of carbon dioxide from the fluid. The alkaline reserve, as measured by the carbon dioxide-combining power, is also practically identical with that of blood plasma (55-75 volumes per cent).

The p_H of the fluid in tuberculous meningitis is usually within normal limits (7.4-7.6), the alkalinity increasing on standing, as in normal fluid. In the suppurative meningitis the fluid is slightly more acid (p_H 7.2-7.5), the increase being due, in all probability, to the presence of lactic acid. When the fluid is allowed to stand, the acidity shows much less tendency to decrease than in the case of normal fluids, actually increasing in some instances (Levinson). This is perhaps due either to an increased rate of glycolysis or fermentation, or to increased production of carbon dioxide by the cells present in the fluid, balancing the loss of carbon dioxide which occurs when the fluid stands exposed to air.

TREATMENT OF MONILIASIS VULVAE

To the Editor:—*I would appreciate information on the therapy of moniliasis vulvae. Aqueous gentian violet, 2 per cent, has been used as have iodine and vinegar douches. There is no evidence of diabetes mellitus.*

Julius N. Bell, M.D., Kewanee, Ill.

Answer.—It is assumed that by the treatment of moniliasis vulvae, also is meant vaginitis. If the lesion is only of the vulva, other conditions must be thought of, such as kraurosis, leukoplakia, carcinoma, benign warts and ring worm. If it is of the vagina also, use of methylrosaniline chloride (gentian violet) appears to be the treatment of choice. It can be administered several ways:

1. Scrub the vagina with a green soap (not tincture) and paint generously with 2 per cent aqueous methylrosaniline chloride. Repeat in five to seven days until all symptoms and signs are gone.

2. Use methylrosaniline chloride jelly individual dose applicators, inserted like a tampon and insert a tampon afterward, leaving it in for 24 hours. Repeat once a week until cured.

3. Use methylrosaniline chloride suppositories until cured; these when used daily are irritating. Combinations of the above are useful. Propionate compound jelly (propion gel®) has also been reported as helpful.

One should ascertain that a mixed infestation is not present. Trichomonas commonly occurs with yeast; this condition can be treated with diiodohydroxyquinoline or other appropriate remedies. Other lesions, such as cervical erosions, should also be treated. On occasion, overtreatment causes as much or more trouble as the original infestation. In this case, stopping all treatment and merely giving weak vinegar or lactic acid douches will bring relief.

PIGMENTATION FOLLOWING LACERATIONS

To the Editor:—*A patient received facial lacerations in an auto accident. While scars are well healed but irregular, they show deep pigmentation, which extends somewhat beyond the outline of the injury. They are very disfiguring. Please give information as to the permanency of this pigmentation.*

R. C. Hunt, M.D., Fairmont, Minn.

Answer.—Pigmentation of the skin and subcutaneous tissues may result from friction, pressure, heat, other physical and chemical agents, chronic infection, chronic inflammatory processes or wounds. The slightest trauma in dark-complexioned persons may produce an increase in pigmentation. Therefore, it is not unusual for deep pigmentation to form in and around the scars of wounds, especially if the wound took a long time in healing.

Increased pigmentation may be due to increased melanin (iron free pigment), hemosiderin (iron containing pigment) or deposits of foreign or extraneous materials. If foreign or extraneous materials have been tattooed in the wound areas the discoloration may be permanent and require surgery for removal. If the pigmentation is due to hemosiderin or increased melanin, many months may pass before the normal color of the skin returns. In some cases, when the pigmentation is due to increased melanin, it may remain indefinitely.

HIGH DIASTOLIC BLOOD PRESSURE

To the Editor:—*A 39 year old man has a blood pressure of 130/100, otherwise he is apparently healthy. He is 5 ft. 10 in. tall, weighs 195 lb., is a nondrinker and smokes 20-25 cigarets a day. What treatment will lower the diastolic pressure? What may be the significance of the low pulse pressure?*

Daniel Rosenfeld, M.D., Rockville Centre, N. Y.

Answer.—In the first place, it is important that one ascertain that the blood pressure readings are correct. The auscultatory method of blood pressure determination is sometimes open to error because of the occurrence of an auscultatory gap; for example, with aortic stenosis or hypertension or both, there may be an area of auscultatory silence of 20 or 30 mm. above what is erroneously considered the systolic pressure. It is possible that the systolic reading may be 180 with silence from 160 to 120 or 130 with the diastolic reading at 100 or 90. It is even possible that an auscultatory gap may come with relatively low pressure with systolic at 130 and diastolic at 70 and a gap between 100 and 80. A small pulse pressure otherwise suggests aortic stenosis, pericardial constriction, slight diastolic hypertension, which may occur early in the development of essential hypertension (hyperpiesia), or even coronary insufficiency, such as may be found in a few patients at the beginning of their illness with angina pectoris. A relatively high diastolic pressure without systolic hypertension has been seen also in rare cases of coarctation of the aorta. Follow-up studies of this case may prove to be of considerable interest and importance.

URETHRAL PAPILLOMAS

To the Editor:—*Can podophyllin be safely used in the treatment of recurrent urethral papillomas? Can it be instilled directly, thereby bathing normal mucosa as well as pathological mucosa without injuring the former? If not, can it be applied directly to involved areas by endoscope? What percentage and what vehicle is best for such a condition?*

Murray Russell, M.D., Beverly Hills, Calif.

Answer.—Podophyllin (25 per cent) in oil solution or in ointment is effective in removal of urethral papillomas, especially condyloma acuminatum. Although podophyllin has been used along all portions of the urethra and even in the bladder, its use should probably be restricted to warts that occur at or near the urethral meatus. Although it may not cause permanent damage to normal mucosa if washed off in several hours, it can cause severe local irritation and ulceration. In order to avoid subsequent stricture or to prevent overlooking early carcinoma, one should treat deep-seated warts by instrumental methods.

GENITAL TUBERCULOSIS

To the Editor:—*A married woman has had amenorrhea since the age of 17. Her first menstrual period was at age 13, and periods were regular for the next four years, after which she missed months at a time. Two years ago she underwent dilatation and curettage for possible determination of the etiology of her sterility, and a diagnosis of tuberculosis of the endometrium was made from the endometrial scrapings. Physical examination disclosed nothing essentially abnormal. X-rays of the lungs were normal. Results of tuberculin and sedimentation tests were negative. The patient's weight has been more or less stationary, and nutrition has been maintained. The only symptom suggestive of any disturbance has been night sweats, which have subsided with dihydrostreptomycin injections. Any information that you could give me concerning treatment would be appreciated.* *M.D., Rhode Island.*

Answer.—Since this seems to be a local infection in the genital organs (uterus and perhaps tubes), conservative treatment can be advised. First, it is recommended that cervical smears for acid-fast bacilli be made. At this date they may not be found, but a thorough search should be made nevertheless and an animal inoculated. The tuberculin test should be repeated. The reaction should be positive if the process is tuberculosis. Higher dilutions of tuberculin may be required to prove the presence of the tuberculous infection in this type of case.

The treatment with dihydrostreptomycin is entirely rational—about 1.5 Gm. a day for 60 to 90 days. Paraaminosalicylic acid may be given after the dihydrostreptomycin treatment or concurrently with it—about 1 Gm. per 10 pounds (4.5 Kg.) of body weight in four daily doses. It may be dissolved in water and given with fruit juices or other liquids. It is better to give it around meal time, because otherwise it causes irritability and nausea. The sodium salt is much better than the free acid. The free acid may be neutralized by addition of 0.6 Gm. of sodium bicarbonate per gram of drug.

If the symptoms are not controlled by treatment with the respective drugs, or if they recur after the treatment has been finished, surgery should be resorted to. The condition in so many of these cases is controlled and ultimately cured by drug therapy that surgery is rarely necessary.

EARLY CANCER OF CERVIX AND THE SCHILLER TEST

To the Editor:—*Please discuss the Schiller test (Gram's iodine) for early cancer of the uterine cervix.*

Joseph G. McKinnon, M.D., Hattiesburg, Miss.

Answer.—J. P. Greenhill (Office Gynecology, ed. 5, Chicago, Yearbook Publishers, 1949) presents the following data concerning the Schiller test. Kermauner and later Schiller proved that in carcinoma of the portio vaginalis, which constitutes about 96 per cent of the cancers of the cervix, there is such an early stage that it cannot be recognized with the naked eye. In this early stage there is no invasion of the underlying tissue; the only sign of malignancy is a change within the cells. It is well known that the stratified squamous epithelium of the vagina and the portio contains glycogen, provided it does not become keratinized. Lahm observed that this glycogen disappears suddenly when the squamous epithelium changes into carcinoma. Therefore, the proof of the presence or absence of glycogen may serve to distinguish normal from cancerous cells. Schiller discovered a means of detecting this in the living woman in a harmless way. He found that, if an aqueous solution of iodine is poured on the cervix, the normal stratified squamous epithelium of the cervix and vagina assumes a mahogany brown stain in about 30 seconds, whereas carcinomatous areas remain unstained and therefore are whitish. Hence, there is a sharp demarcation between the carcinomatous and the normal epithelium. The iodine solution which must be used is Gram's solution. Schiller advocated Lugol's solution for his test, but he referred to the Lugol solution used for bacterial staining. This is equivalent to our Gram solution, which consists of 1 part iodine, 2 parts potassium iodide and 300 parts water.

A speculum is introduced into the vagina and all mucus and discharge are removed from the cervix and upper part of the vagina. Then 20-30 cc. of Gram's solution is poured on the

cervix and upper part of the vagina from a cup or other vessel having a long, sharply pointed tip. The solution is then spread around with a cotton applicator or a cotton pledget. After half a minute the excess of solution is gently absorbed with a pledget of dry cotton. The cervix is then examined carefully in good light. If it is mahogany brown all over, there is no carcinoma, because all the epithelium contains glycogen. If one or more white unstained areas are observed, there is only a suspicion of carcinoma, because not all white areas signify cancer. There are other conditions, benign ones, in which glycogen disappears from the epithelium. Glycogen is always absent in the presence of carcinoma but not only in its presence. In some instances white areas are observed because there is no squamous epithelium, as in the following conditions: (1) trauma, (2) leukoplakia, (3) keratinization developing in a prolapse, (4) hyperkeratosis of the squamous epithelium of the cervix, such as occurs in syphilis, (5) erosions of the cervix and (6) some nabothian follicle cysts superficially situated in the cervix.

Since all white areas are not carcinoma, the only way to determine whether cancer is present is to remove all white areas and have them examined microscopically. Because the carcinoma is limited to the surface cells and there is no invasion of the underlying tissue, all that is necessary is to scrape off the white area with a sharp curet or scalpel or to lift it off with a curet.

Schiller suggested that these pieces of tissue be fixed not in watery formaldehyde but in Carnoy's solution, which consists of 60 parts absolute alcohol, 30 parts chloroform and 10 parts glacial acetic acid.

This test is to be used only when the cervix appears normal to the naked eye, that is, when the squamous epithelium is intact. When an outspoken carcinoma is present with ulceration and destruction of tissue, this test is unnecessary and will fail to reveal the characteristic white areas. The Gram solution must be replenished frequently, because it is essential that it be fresh.

The Schiller test will not reveal an early carcinoma often. However, even if only one early cancer is detected among a few hundred women, detection by the test will probably mean the saving of that one woman's life.

CHRONIC PANCREATITIS

TO THE EDITOR:—*What is the present method of treatment of chronic pancreatitis?* *M.D., New York.*

ANSWER.—The treatment of chronic pancreatitis may be divided into two parts—that concerned with elimination of etiological factors and that directed to relief of symptoms.

1. When a diagnosis of chronic pancreatitis has been established, it is important that the functional state of the hepatobiliary system be determined by thorough laboratory and clinical investigation. In all cases in which chronic pancreatitis is accompanied by evidence of hepatobiliary disease, treatment should first be directed, medically and surgically, to the correction of these defects. When disease exists elsewhere in the gastrointestinal tract, this, likewise, must be corrected by appropriate measures.

2. When etiological factors have been corrected, the remaining treatment of pancreatitis is directed toward the correction of functional errors produced by elimination or reduction of pancreatic enzymes and hormones and, second, by measures directed to relieve the distressing symptoms of the disease. None of these measures will correct the underlying pancreatic abnormal condition. The diet should be high caloric with fat restriction, to reduce the steatorrhea. The amount of fat restriction depends on the degree of steatorrhea. In general, the patient should be able to tolerate from 50 to 100 Gm. of fat. It may be helpful, in addition, to administer bile salts by mouth at meal time to further minimize the symptoms due to a large amount of undigested neutral fats in the gastrointestinal tract. Other medications should be administered as follows: pancreatin in large doses, up to 15 Gm. daily divided equally between the three meals or, preferably, the triple strength pancreatin in correspondingly lesser doses; calcium to replace that lost in the feces, and supplementary vitamin B complex. If diabetes mellitus is present, it may be of a severe grade and may require large doses of insulin for control. Surgical intervention is indicated for cysts, abscesses, pancreatic calculi, obstruction to the pancreatic duct system and intractable pain. In the latter case, sympathectomy has been reported to be of some value. The inquirer is directed to a complete survey of this situation reported by Comfort, Gambill and Baggenstoss (*Gastroenterology* **6**:239 [April]; **6**:376 [May] 1946). The indications for surgical treatment of chronic pancreatitis are thoroughly discussed in this article.

TRICHIASIS

TO THE EDITOR:—*An elderly physician diagnosed trichiasis in his left eye in August 1949. A well known eye man removed two inverted lashes. A similar condition was treated at practically monthly intervals during the remainder of the year. In 1950 the patient was annoyed by inversion in one or both lids 14 times at intervals of three to 10 weeks. On April 25, 1950, in addition to plucking two lashes from the upper lid and three from the lower, the oculist removed a sac of calcium from the outer canthus of the same eye. Two lashes were removed from the lower lid, on December 27, and a similar sac in the same place was treated in April. Three eminent oculists say the condition is likely to continue indefinitely and that the etiology is not known. Can you give any advice?* *M.D., New Jersey.*

ANSWER.—Minor trichiasis is usually treated by electric epilation of the offending lashes. Where the condition is persistent and more widespread, "Ziegler" cautery punctures are done in the skin near the outer lid margin to promote ectropion from controlled scarring. Severer trichiasis, if due to entropion, is treated by a "skin-muscle" operation. The offending spastic marginal muscle is removed and the tarsal plate grooved, and the lid heals in good position. Recurrent calcium deposits in and under the conjunctiva require general treatment for calcinosis and local conjunctival treatment. The general treatment for calcinosis should include reduction in the use of vitamin D. Locally in the conjunctiva the calcium plaques are removed and a mild collyrium should be persistently used for conjunctivitis. Irrigations of upper and lower canaliculi should be done to insure freedom from a chronic infection, such as Streptothrix.

TINNITUS RESULTING FROM ACOUSTIC TRAUMA

TO THE EDITOR:—*A 60 year old man complains of tinnitus (left ear), following a gunshot explosion three years ago. He has been treated by ear specialists and neuropsychiatrists, with no improvement. I have tried foreign protein, histamine, diathermy, nicotinic acid, vitamin E, testosterone, diethylstilbestrol and calcium gluconate intravenously and iodides. Can you suggest anything else that might be tried?*

W. J. Hossley, M.D., Deming, N. Mex.

ANSWER.—Tinnitus can be relieved by therapy only when it is due to reversible ear pathology, such as occlusion of the eustachian tube, impacted cerumen, otitis media or otosclerosis (in which the fenestration operation frequently, but not always, improves the tinnitus). When tinnitus is a result of acoustic trauma following gunshot explosion, there is damage to the cochlea which is irreversible and therapy is of no value. The patient must be encouraged to learn to live with his subjective head noise. A mild nerve sedative may be of slight help.

MONGOLISM

TO THE EDITOR:—*A 3 month old mongoloid infant is the fifth child. The other four are normal. The mother, age 38, had a thyroidectomy for a large adenoma in 1947. Is there any relation between the thyroidectomy and the mongoloid child?*

G. A. Goshgarian, M.D., Round Lake, Ill.

ANSWER.—As far as can be determined, disease of the maternal thyroid gland plays no role in the etiology of mongolism in the offspring. It is rare for more than one mongoloid child to be born in a family. On the other hand, the condition has been observed in brothers and sisters a number of times. Mongolism may occur either early or late in the reproductive life of the mother. It occurs much more frequently at the latter time. There is no treatment for the condition.